

Bryan W. Shaw, Ph.D., P.E., *Chairman*  
Toby Baker, *Commissioner*  
Jon Niermann, *Commissioner*  
Richard A. Hyde, P.E., *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

January 22, 2016

MR WALTER R STAMM  
PLANT MANAGER  
HUNTSMAN PETROCHEMICAL LLC  
5451 JEFFERSON CHEMICAL RD  
CONROE TX 77301-6837

**RECEIVED**

**JAN 26 2016**

**TCEQ  
CENTRAL FILE ROOM**

Permit by Rule Registration Number: 136896  
Huntsman Petrochemical LLC  
Huntsman Petrochemical Conroe Plant Add One Additional Reactor to Each SAU Train  
Conroe, Montgomery County  
Regulated Entity Number: RN100219740  
Customer Reference Number: CN603603093  
Account Number: MQ-0012-Q  
Affected Permit: 4788, O-1384

This is in response to your certification Form PI-7 CERT regarding the adding of two new Specialty Amines Unit (SAU) Reactors at the Huntsman Petrochemical Conroe Plant located at 5451 Jefferson Chemical Rd, Conroe, Montgomery County. We understand that you have certified that the reactors are not the bottleneck in your two production process trains. You have certified that the Tower FG-21 production is limited by the reboiler EG-18 operating with a set point of 400°F on plant steam (450 psig) which result in a 100% open steam valve.

Huntsman Petrochemical LLC has certified the emission increases under Title 30 Texas Administrative Code (TAC) §§ 106.261 and 106.262. For rule information see:  
[www.tceq.texas.gov/permitting/air/nav/numerical\\_index.html](http://www.tceq.texas.gov/permitting/air/nav/numerical_index.html)

As referenced in 30 TAC § 116.116(d)(2), all changes authorized under Chapter 106 to a permitted facility shall be incorporated into the NSR Permit No. 4788 when it is amended or renewed.

The company is also reminded that these facilities may be subject to and must comply with other state and federal air quality requirements.

If you need further information or have questions, please contact Mr. John Gott, P.E. at (512) 239-1238 or write to the Texas Commission on Environmental Quality (TCEQ), Office of Air, Air Permits Division, MC-163, P.O. Box 13087, Austin, Texas 78711-3087.

Mr. Walter R Stamm  
January 17, 2016  
Page 2

This action is taken under the authority delegated by the Executive Director of the TCEQ.

Sincerely,

A handwritten signature in black ink, appearing to read 'Samuel Short', followed by a long horizontal line extending to the right.

Samuel Short, Manager  
Rule Registrations Section  
Air Permits Division

cc: Air Section Manager, Region 12 – Houston

Project Number: 244374

# Emission Sources - Certified Increased Emission Rates

Registration Number 136896

This table lists the certified increased emission rates and all sources of air contaminants on the applicant's property covered by this registration. The emission rates shown are those derived from information submitted as part of the registration for PBR.

EPN / Emission Source	Specific VOC or Other Pollutants	VOC		NOx		CO		PM <sub>10</sub>		PM <sub>2.5</sub>		SO <sub>2</sub>		Other	
		lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
SAUFUG / Specialized Amine Unit Fugitives		<0.01	0.02												
<b>TOTAL EMISSIONS :</b>		<0.01	0.02												
<b>MAXIMUM OPERATING SCHEDULE:</b>		<b>Hours/Day</b>		<b>Days/Week</b>		<b>Weeks/Year</b>		<b>Hours/Year</b>		8760					

## TECHNICAL REVIEW: AIR PERMIT BY RULE

<b>Permit No.:</b>	136896	<b>Company Name:</b>	Huntsman Petrochemical LLC	<b>APD Reviewer:</b>	Mr. John Gott, P.E.
<b>Project No.:</b>	244374	<b>Unit Name:</b>	Huntsman Petrochemical Conroe Plant	<b>PBR No(s).:</b>	106.261, 106.262

GENERAL INFORMATION					
<b>Regulated Entity No.:</b>	RN100219740	<b>Project Type:</b>	Permit by Rule Application		
<b>Customer Reference No.:</b>	CN603603093	<b>Date Received by TCEQ:</b>	November 2, 2015		
<b>Account No.:</b>	MQ-0012-Q	<b>Date Received by Reviewer:</b>	November 10, 2015		
<b>City/County:</b>	Conroe, Montgomery County	<b>Physical Location:</b>	5451 Jefferson Chemical Rd		

CONTACT INFORMATION					
<b>Responsible Official/ Primary Contact Name and Title:</b>	Mr. Walter R Stamm Plant Manager	<b>Phone No.:</b>	(936) 760-6226	<b>Email :</b>	WALTER_STAMM@HUNTSMAN.COM
		<b>Fax No.:</b>	(936) 760-6280		
<b>Technical Contact/ Consultant Name and Title:</b>	Mr. Mark Strohbeck Staff Environmental Specialist	<b>Phone No.:</b>	(936) 760-6224	<b>Email :</b>	MARK_W_STROHBECK@HUNTSMAN.COM
		<b>Fax No.:</b>	(936) 760-6280		

GENERAL RULES CHECK	YES	NO	COMMENTS
Is confidential information included in the application?		X	
Are there affected NSR or Title V permits for the project?	X		NSR 4788, O-1384
Is each PBR > 25/250 tpy?		X	
Are PBR sitewide emissions > 25/250 tpy?		X	Permit 4788 has been to public notice.
Are there permit limits on using PBRs at the site?		X	
Is PSD or Nonattainment netting required?		X	
Do NSPS, NESHAP, or MACT standards apply to this registration?	X		40 CFR 63 Subchapter H, FFFF
Does NOx Cap and Trade apply to this registration?		X	
Fee Paid?	X		Epay
Is the facility in compliance with all other applicable rules and regulations?	X		

DESCRIBE OVERALL PROCESS AT THE SITE
Huntsman Petrochemical LLC Conroe plant is a specialty chemical manufacturing operation that produces a variety of chemicals.
The Huntsman Conroe Specialty Amines Unit (SAU) makes two families of products: methylated amines including ZF10, DMAEE and ZR70 and non-methylated including APM, DMAPA, MOPA, and APDEA. These two families require different catalyst. In order to change production from one family to the other, Huntsman has historically had to open the reactors, drop the catalyst, package and store for future use, and refill the reactors with the other catalyst. This is a labor intensive job with associated safety concerns, causes degradation to the expensive catalyst, creates the potential to damage the reactor heads or gaskets which may result in leaks, as well as extending the downtime between product runs.

DESCRIBE PROJECT AND INVOLVED PROCESS
This is a certified claim under PBR 106.261 and 106.262 for constructing the new reactors to avoid opening the reactors, dropping the catalyst, packaging and storing for future use, and refilling the reactors with the other catalyst. The company states that this is a labor intensive job with associated safety concerns, causes degradation to the expensive catalyst, creates the potential to damage the reactor heads or gaskets which may result in leaks, as well as extending the downtime between product runs. In order to alleviate these issues, Huntsman has added two new reactors to the unit which will contain one catalyst while the other catalyst will remain in the old reactors. The old reactors and new reactors will not be used at the same time, neither in series nor in parallel, and the new reactors will not cause a production increase either on an hourly or an annual basis. All of the upstream and downstream components of the unit are unaffected.
The company states that the Raw materials are piped into the new SAU reactors at high pressure where they undergo a catalyzed reaction. The new reactors will be used to produce one family of products while the old reactors will be used to produce the other. They will not be fed at the same time.
This submittal authorizes the addition of fugitive components associated with the new SAU reactors project. Huntsman proposes to authorize the fugitive emissions under Permits by Rule No. 106.261 and 106.262. The chemical list included in this submittal shows approximately 340 chemicals that the fugitive components may come in contact with.
The company states that the new SAU reactors project will not increase the annual or hourly production capacity at the site. Huntsman is not proposing an increase to the production limit. As such, there will be no upstream or downstream impacts from the second reactor train.
The company submitted information to demonstrate that the reactors are not the bottleneck in the two production process trains. The production snapshot of the operating system demonstrates that the Tower FG-21 production is limited by the reboiler EG-18 operating with a set point of 400 °F on plant steam (450 psig) which result in a 100% open steam valve.
No MSS emissions were submitted or reviewed.



## TECHNICAL REVIEW: AIR PERMIT BY RULE

<b>Permit No.:</b>	136896	<b>Company Name:</b>	Huntsman Petrochemical LLC	<b>APD Reviewer:</b>	Mr. John Gott, P.E.
<b>Project No.:</b>	244374	<b>Unit Name:</b>	Huntsman Petrochemical Conroe Plant	<b>PBR No(s).:</b>	106.261, 106.262

### TECHNICAL SUMMARY - DESCRIBE HOW THE PROJECT MEETS THE RULES

Equipment leak fugitives are estimated based on a source count for the piping installed. The emission factors used for this facility are SOCM I without ethylene factors from the TCEQ Guidance Document, "Equipment Leak Fugitives," dated October 2000. Control efficiencies are based on a 28 VHP Leak Detection & Repair Program combined with quarterly flange monitoring.

### COMMUNICATION LOG

Date	Time	Name/Company	Subject of Communication
11/12/2015	1600	To: Mr. Mark Strohbeck	Voicemail- PBRs are based upon actual to new allowables. The project increase is from your actuals to your permit allowables plus the fugitive emissions. Call the reviewer.
11/12/2015	1615	Mr. Lou Malarcher, Chemical Section	I described the project to Mr. Malarcher. I also provided a copy of the current SC and MAERT. I explained that PBR are based upon actuals to new allowables. Did Mr. Malarcher have any object to the project from a permitting basis? No. Mr. Malarcher stated that to do a permit amendment for a permit not increasing the short term (note there are small fugitive emission increases) or annual allowables is relative simple and could be completed in a six month period.
11/12/2015	1650	To: Mr. Mark Strohbeck	Discussed the project. I explained that PBRs are based upon actual to new allowables. The PBR project increases are not just the fugitive increases but the increases from your actuals to your existing permit allowables plus the fugitive emission increases. He is going to be off tomorrow and out of town early next week so he will have the consultant from Waid & Associates call me tomorrow.
11/16/2015	0808	To: Ms. Jenny Arreola, Waid & Associates, 255-9999	Voicemail- call the reviewer. The PBR increases are based upon actuals to new allowable. The company used allowables to allowables to calculate the increase which is not correct.
11/16/2015	1400	To: Ms. Jenny Arreola, Waid & Associates, 255-9999	Briefly discussed the project. I asked if she understood that PBR are based upon actuals to new allowables. She stated yes. I stated that I would send a deficient email today.
11/19/2015	1300	Mr. Mark W Strohbeck, Ms. Jennifer Arreola, Waid & Associates, Mr. Lou Malarcher, Chemical Section	Office Visit-They described their process and where the two new reactors would be integrated into their process. Their primary assertion was that there was no potential for a production increase and the project should be evaluated on fugitive increases only.
11/23/2015	1647	Fm: MARK_W_STROHBECK @HUNTSMAN.COM	Email- Huntsman Petrochemical LLC - Conroe Plant requests an extension to respond to your request for more information on proposed PBR 136896 until December 2, 2015. See email for more details.
11/24/2015	0757	To: MARK_W_STROHBECK @HUNTSMAN.COM	Email- Extension granted until 0800 Wednesday December 2, 2015.
12/01/2015	1730	Fm: MARK_W_STROHBECK @HUNTSMAN.COM	Email- Please find attached additional information for PBR No. 136896 as requested during our meeting of November 19th.
12/02/2015	0720	To: Kristyn Bower Cc: Samuel Short	Email message to management outlining proposed course of action requesting management approval.
12/3/2015	various	Meeting with Mr. David Reyna, RR Section And Mr. Rick Goertz	Mr. Goertz discussed possible courses of action, how the project could be authorized and the information needed. Also if project could not be approved, the information deemed deficient.
12/3/2015	1400	Meeting Mr. Samuel Short, Mr. David Reyna, RR Section, and Reviewer	Meeting with management where management decided not to recommend project but require more information to justify the company project increase of fugitive only. Management saw no reason to change how we calculate PBR increases based upon the company's submitted information.
12/7/2015	1636	To: MARK_W_STROHBECK @HUNTSMAN.COM	Email--After careful consideration of the information submitted both from your meeting with the review engineer and your letter, I am sorry to inform you that our management did not find the justification to change the method of evaluating PBR increases for your project. However, management did not completely say no but is offering the company the opportunity to provide more documentation about reactor downtime, why the reactors are not bottleneck(s) and increasing process abilities with the new reactors. The addition of new reactors normally equals more emissions than just the fugitives and the company will be given the opportunity to provide actual emissions to new allowables. Please address the downtime that will potentially increase the process abilities and provide more details on bottlenecking (your current submittal addressed several bottlenecks but what is the key or primary bottleneck?). Address the federal requirements for this project.

# **TECHNICAL REVIEW: AIR PERMIT BY RULE**

<b>Permit No.:</b>	136896	<b>Company Name:</b>	Huntsman Petrochemical LLC	<b>APD Reviewer:</b>	Mr. John Gott, P.E.
<b>Project No.:</b>	244374	<b>Unit Name:</b>	Huntsman Petrochemical Conroe Plant	<b>PBR No(s):</b>	106.261, 106.262

12/11/2015	0705	Fm: Mark_W_strohbeckK	Email- See long email justifying their position. – one paragraph- The SAU process unit is tied to the sites primary control device, the plant flare EPN RA22. The plant flare controls multiple process units throughout the plant and the permit allowable was established based on the total flow to the flare from all facilities routed to RA22 as determined through monitoring data and performance tests. The contribution from vent streams routed from the SAU purification section (reactors do not vent directly to control) is a fraction of the total flow. Never the less, nonattainment applicability can be readily determined by taking the 2013 & 2014 reported emissions of VOC (1.8 & 2.3 tons) to establish a baseline of 2.05 tons and subtracting the baseline from the current allowable of 5.7 tons to yield 3.65 tons. When added to the fractional increase in VOC from fugitive components the project increase would be less than 5 tons VOC.
12/15/2015	1100	Mr. Samuel Short, Manager, Ms. Kristyn Bower, Team Leader	Discussed the project and what I expected to hear from the company tomorrow. I knew that the holidays would impact getting the information and any evaluation. I asked Mr. Short that considering the holidays could I not put any deadlines on them until after New Years. Mr. Short agreed to the request.
12/16/2015	1300	To: Ryan Mayces Mr. Rick Goertz, Chemical Section	Phone Conference—Discussed the project and what the company needs to submit for us to approve the project. Mr. Mayces made a case for the project being limited both upstream and downstream.
1/4/2016	1100	To: Ryan Mayces	I am expecting some information from you on the Huntsman project. Any idea when you submit it to me? Should be in a day or two, I got to run the answer by the company.
1/7/2016	1023	Fm: Ryan S. Mayces <RMayces@WAID.com>	Email-See long email for details. Last paragraph.- Based on this information, production is limited by the low pressure reactor section. There is no potential increase in actual or allowable emissions from the process as a result of this project. The reactors were installed solely to reduce degradation of the catalyst, to minimize labor and to reduce potential safety and environmental issues. Based on the information provided, Huntsman believes that the project meets the requirements of the PBR and requests approval of the registration.
1/7/2016	1430	Mr. Rick Goertz, Chemical Section office visit	Review the company's email. Had problems with the process flow not making sense with the explanation in the email.
1/7/2016	1530	Mr. Ryan Mayces, Waid & Assoc. 281-513-1936 (cello)	I explained that we were having a problem with the explanation write-up and the process flow diagram. Mr. Mayces stated that he would correct and send a corrected email.
1/7/2016	1624	Fm: Ryan S. Mayces <RMayces@WAID.com>	Email-I have updated the PFD to clarify how the SAU process operates. E-G-25 & E-G-26 are considered the "low pressure reactors", downstream T-G-8 and 9 are process vessels where additional reaction may occur depending on product run.
1/8/2016	1100	Mr. Rick Goertz, Chemical Section office visit	Mr. Rick Goertz agreed with the reviewer that if the bottleneck (Tower F-G-21 and reboiler E-G-18 with current steam pressure and 400 oF set point) is stated in the PBR letter, the project could be approved.
1/12/2016	1530	Mr. Samuel Short, RR Mgr. Ms. Kristyn Bower RR Team Leader	Office visit—Reviewed the Company submittal and why Mr. Goertz and the reviewer were recommending the project. Can Mr. Short agree to the recommended course of action which is to authorize the second reactor with the limiting bottleneck stated in our PBR registration letter? Mr. Short stated that he can agree.
1/15/2016	1430	To: Mr. Mark Strohbeck	I got favorable opinion for your project from my manager and I will list the bottleneck facilities and conditions in the authorization. I plan to list the tower, FG-21, and the associated reboiler EG-18 operating with a set point of 400 oF actual temperature of 381.05 oF with the steam valve 100% open. I see a steam pressure of 16.46 psig on the operating snapshot. The reviewer asked Mr. Strohbeck what is the steam pressure? Mr. Strohbeck responded that 16.46 figure must refer to something else. He stated that the reboiler was fed from the 450 psi plant's steam system. The reviewer asked if the 450 was psia or psig? He stated that it was psig.

# **TECHNICAL REVIEW: AIR PERMIT BY RULE**



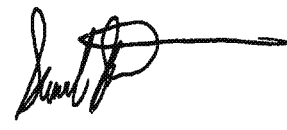
<b>Permit No.:</b>	136896	<b>Company Name:</b>	Huntsman Petrochemical LLC	<b>APD Reviewer:</b>	Mr. John Gott, P.E.
<b>Project No.:</b>	244374	<b>Unit Name:</b>	Huntsman Petrochemical Conroe Plant	<b>PBR No(s):</b>	106.261, 106.262

PBR Emission Limits Distance = 900', K= 39						
Chemical	PBR Claimed	L, mg/m <sup>3</sup>	Emission Limit (E = L/K), lb/hr	Emission Limit tpy	Actual Emissions lb/hr	Actual Emissions tpy
Company listed approx.. 340 speciated compounds as to applicability of 261 or 262. Then declared the emissions and the limits under PBR 106.261 and 106.262.	261/262 See file for detail list of approx. 340 speciated compounds.				0.0058	0.025
Representative 261 chemical*	261		6.0	10.0	0.0058	0.025
Representative 261 chemical*	261		1.0	4.38	0.0058	0.025
Representative worst-case 262 chemical *— Formacel, 50% Formaldehyde or formalin	262	0.37	0.0095	0.042	0.0058	0.025

\*Subset of the first line in table of 261/262 compounds (all emissions) emissions.

ESTIMATED EMISSIONS															
EPN / Emission Source	Specific VOC or Other Pollutants	VOC		NOx		CO		PM <sub>10</sub>		PM <sub>2.5</sub>		SO <sub>2</sub>		Other	
		lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
SAUFUG / Specialized Amine Unit Fugitives		<0.01	0.02												
<b>TOTAL EMISSIONS :</b>		<0.01	0.02												
<b>MAXIMUM OPERATING SCHEDULE:</b>		Hours/Day		Days/Week		Weeks/Year		Hours/Year		8760					

SITE REVIEW / DISTANCE LIMIT	Yes	No	Description/Outcome	Date	Reviewed by
Site Review Required?		X			
PBR Distance Limits Met?	X		The company claims that >600' exists to the nearest property line and >900' to the nearest off-property structure.	November 12, 2015	John C. Gott, P.E.

	TECHNICAL REVIEWER	PEER REVIEWER	FINAL REVIEWER
<b>SIGNATURE:</b>			
<b>PRINTED NAME:</b>	Mr. John Gott, P.E.	Ms. Kristyn Bower	Mr. Samuel Short, Mgr.
<b>DATE:</b>	January 15, 2016	January 20, 2016	January 22, 2016

BASIS OF PROJECT POINTS	POINTS
Base Points: 261/262	2.0
Project Complexity Description and Points: Research, extra compounds, and communications/meetings (not all calls or email logged since would make TRV too long).	0.5 2.5 6.0
Technical Reviewer Project Points Assessment:	11.0
Final Reviewer Project Points Confirmation:	

John Gott

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**From:** Ryan S. Mayces <RMayces@WAID.com>  
**Sent:** Thursday, January 07, 2016 4:24 PM  
**To:** Richard Goertz; John Gott  
**Cc:** Jennifer Arreola; Mark W Strohbeck (mark\_w\_strohbeck@huntsman.com)  
**Subject:** Huntsman Conroe - SAU PFD  
**Attachments:** NEWSAURXPROJ Layout1 (1).pdf

I have updated the PFD to clarify how the SAU process operates. E-G-25 & E-G-26 are considered the "low pressure reactors", downstream T-G-8 and 9 are process vessels where additional reaction may occur depending on product run.

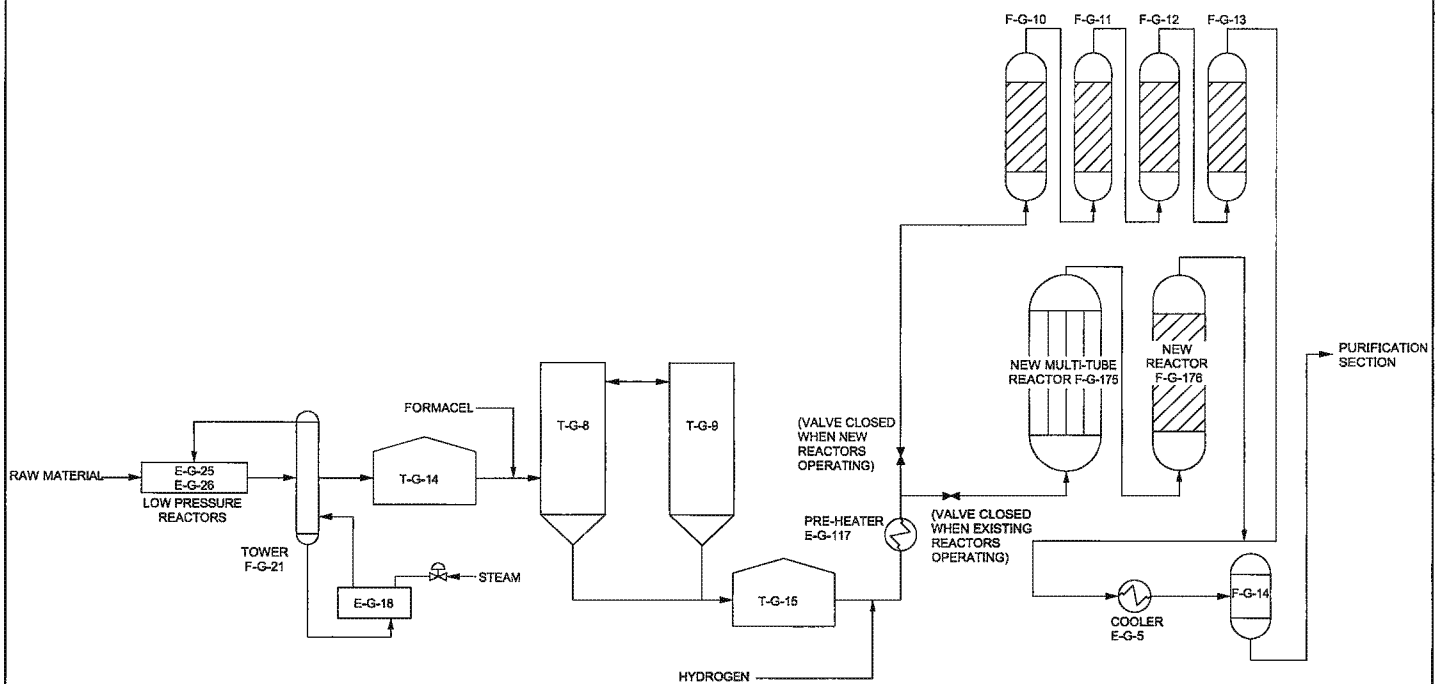
Thanks,

Ryan S. Mayces  
Waid Environmental  
2600 South Shore Blvd., Suite 300  
League City, TX 77573  
Cell: (281) 513-1936  
Phone: (281) 333-9990 Fax: (512) 255-8780

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# NEW SAU REACTORS PROJECT PROCESS FLOW DIAGRAM



<b>WALD ENVIRONMENTAL</b>				
HUNTSMAN PETROCHEMICAL CORPORATION				
NEW SAU REACTORS PROJECT				
DATE	BY	DATE	BY	DATE
DVV	1/4/16	1/7/16	NEWSAURXPRJ	5
H:\CLIENTS\HUNTSMAN CONRDE\MCC8410\ACAD				

John Gott

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**From:** Ryan S. Mayces <RMayces@WAID.com>  
**Sent:** Thursday, January 07, 2016 10:23 AM  
**To:** Richard Goertz; John Gott  
**Cc:** Mark W Strohbeck (mark\_w\_strohbeck@huntsman.com); Jennifer Arreola  
**Subject:** FW: Response to TCEQ  
**Attachments:** pic06900.gif; NEWSAURXPROJ Layout1 (1).pdf

Gentlemen,

In our prior correspondence and most recent discussions, Huntsman identified several bottlenecks in the SAU process that would prevent an increase in throughput or production associated with the reactor additions. Huntsman has reviewed process data to provide an example of the limitations we had discussed. The following discussion and associated attachments provide conclusive evidence of existing limitations in the low pressure reactor section of the process.

After running through the low pressure reactors the stream flows to a column (FG-21) to recover the un-reacted portion of one of the raw materials. The rate of this column is limited by steam input to the associated reboiler (EG-18). As you can see from the trend in the gray pop-up box of the attached graphic, the steam valve is open to 100% (white line) shortly after startup of the low pressure reactors and stays there throughout the run. The set point is calling for 400°F but this snapshot indicates that the temperature is at 381.05 °F with the valve 100% open. Throughput through the column must be regulated to achieve the required recovery and without modification of reboiler EG-18, throughput through the process is limited.

Based on this information, production is limited by the low pressure reactor section. There is no potential increase in actual or allowable emissions from the process as a result of this project. The reactors were installed solely to reduce degradation of the catalyst, to minimize labor and to reduce potential safety and environmental issues. Based on the information provided, Huntsman believes that the project meets the requirements of the PBR and requests approval of the registration.

Thanks,

Ryan S. Mayces  
Waid Environmental  
2600 South Shore Blvd., Suite 300  
League City, TX 77573  
Cell: (281) 513-1936  
Phone: (281) 333-9990 Fax: (512) 255-8780

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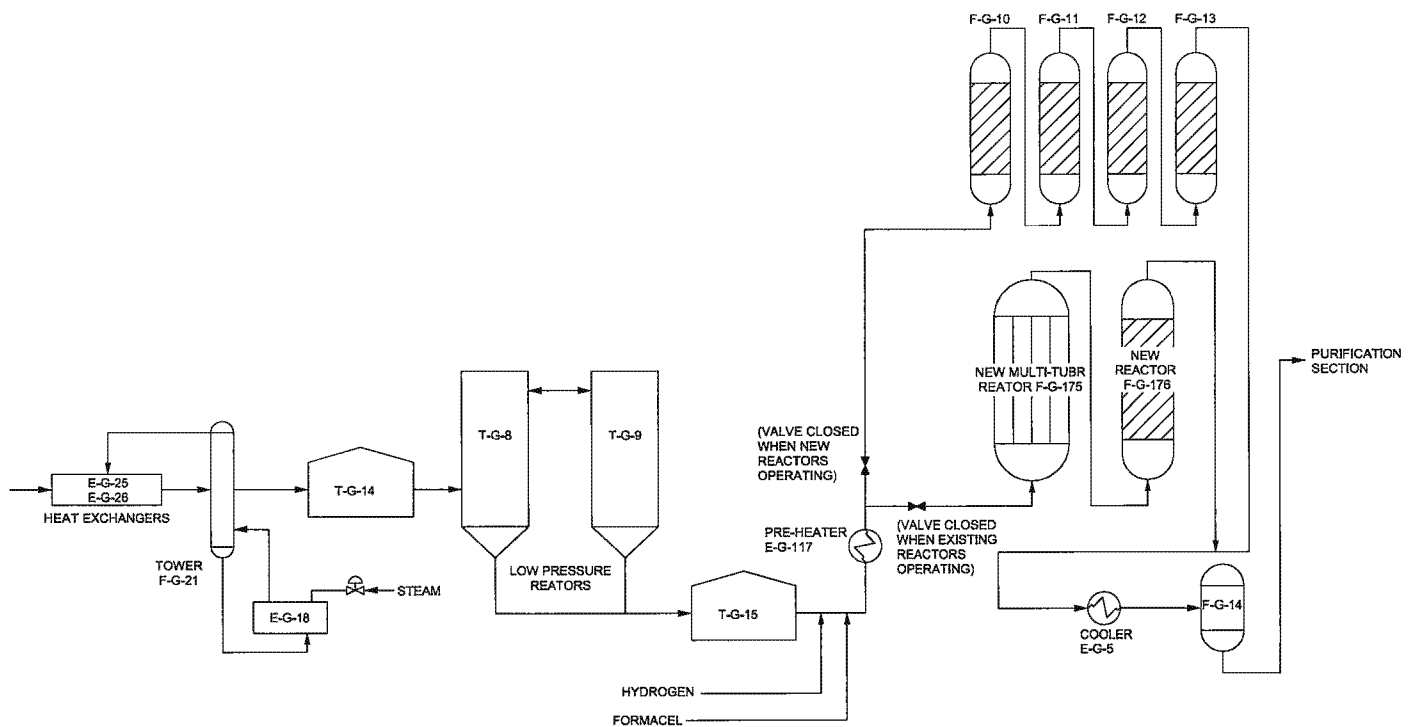


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# NEW SAU REACTORS PROJECT PROCESS FLOW DIAGRAM



<b>WALD ENVIRONMENTAL</b>			
HUNTSMAN PETROCHEMICAL CORPORATION			
NEW SAU REACTORS PROJECT			
DVV	1/4/16	1/7/16	NEWSAURXPRJ 4
H:\CLIENTS\HUNTSMAN CONROE\HCC8410\ACAD			

John Gott

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**From:** Mark W Strohbeck <mark\_w\_strohbeck@huntsman.com>  
**Sent:** Friday, December 11, 2015 7:05 AM  
**To:** John Gott  
**Cc:** jarreola@waid.com; Kristyn Bower; Richard E Hare; Samuel Short; RMayces@WAID.com  
**Subject:** RE: Proposed PBR 136896 to add reactors and piping - request for extension for response

Mr. Gott,

We appreciate the opportunity to provide additional information to assist with your review.

#### Nonattainment Applicability

The SAU process unit is tied to the sites primary control device, the plant flare EPN RA22. The plant flare controls multiple process units throughout the plant and the permit allowable was established based on the total flow to the flare from all facilities routed to RA22 as determined through monitoring data and performance tests. The contribution from vent streams routed from the SAU purification section (reactors do not vent directly to control) is a fraction of the total flow. Never the less, nonattainment applicability can be readily determined by taking the 2013 & 2014 reported emissions of VOC (1.8 & 2.3 tons) to establish a baseline of 2.05 tons and subtracting the baseline from the current allowable of 5.7 tons to yield 3.65 tons. When added to the fractional increase in VOC from fugitive components the project increase would be less than 5 tons VOC.

#### SAU Capacity Limits

As previously discussed, the addition of the new reactors will not result in an actual increase in emissions from the purification section or an increase in the allowable emission rate from the plant flare (RA22). The physical limits of the upstream and downstream equipment restrict the throughput of the reactors. A detailed discussion is provided below.

The Specialty Amines Unit (SAU) consists of three distinct parts: a low pressure reaction section, a high pressure reaction section, and the purification section. The process is continuous and the limits of the low pressure and purification sections restrict the throughput to the reactors.

The low pressure section is used to make feed for the high pressure section. This entails making material and initially storing in an intermediate vessel. This intermediate vessel is used to start the high pressure reactors. Once acceptable material is produced, the low pressure reactors continuously feed the high pressure reactors. There is a limit to how fast the low pressure reaction section can run due to cooling requirements and feed rates. This limits the rate at which the high pressure section can run.

If the high pressure section runs too fast, the low pressure will run out of feed and shut down the high pressure reactors. The highest throughputs occur when the intermediate tank is at a high level and the low pressure reactors are operating. However, as the tank level decreases the high pressure reactor throughput begins to equilibrate to the low pressure section. The low pressure section is one of the restrictions on higher production levels and the low pressure reactors were not modified as part of this project.

After the high pressure reaction is complete, the contents are fed to WIP tanks that will then feed the purification section. Once the material is determined to meet quality standards, the high pressure reactors will feed the purification section continuously. If the high pressure reactors run too fast, the WIP tanks will fill up and shut down until the purification has lowered the WIP tank levels. If the purification section is fed too fast, problems occur with product

quality and available storage. Quality control and limits on product storage are limits on the purification section that restrict the production from the reactors.

Along with the piping configuration, the physical restrictions listed above limit the ability for the new reactors to run simultaneously with the existing reactors. Since the existing physical limitations were not modified as part of this project there will be no actual increase in throughput to the purification section and therefore no increase in emissions from the addition of the new reactors.

#### Process Unit Uptime

The project was not designed to increase the uptime of the process unit as reactor turnover has been historically managed by extending the runs of product campaigns. This project does not have the potential to increase uptime as uptime is dependent on product demand.

The project does not trigger federal permitting and there is no actual emissions increase from the process vent streams. The fugitive component increase represents the total emissions increase from the project and those emissions are authorized under PBRs 106.261 & 262.

If you need any further information, please let me know.

Mark W. Strohbeck  
Huntsman Petrochemical LLC  
Conroe Plant  
936-760-6224 (voice)  
936-760-6280 (fax)

From: John Gott <john.gott@tceq.texas.gov>  
To: Mark W Strohbeck <mark\_w\_strohbeck@huntsman.com>, Samuel Short  
<samuel.short@tceq.texas.gov>,  
Cc: "jarreola@waid.com" <jarreola@waid.com>, Kristyn Bower  
<Kristyn.Bower@tceq.texas.gov>, Richard E Hare  
<richard\_e\_hare@huntsman.com>  
Date: 12/07/2015 04:36 PM  
Subject: RE: Proposed PBR 136896 to add reactors and piping - request  
for extension for response

Dear Mr. Strohbeck:

We appreciate your consideration of a PBR to accomplish the project to add new reactors and piping to your Huntsman Petrochemical Conroe Plant.

Authorizing air emissions by the simplest, most direct method and minimum information required within the federal, state and agency rules is our goal.

In our meeting of November 19, 2015 where I explained that the TCEQ method of evaluating PBR increases are from actual emissions to the new allowables. The company asserted that the only emission increases were from the new fugitives and the project should be evaluated that way. For your situation, where the company is not requesting any increase in allowable, the allowables would be the current Permit 4788 limits. At the meeting and the

subsequent email letter dated December 1, 2015, the company asserted that the project increases were just going to be fugitives from the new reactors since the reactors were not the limiting facility or facilities. The company claims that from the intermediate tank which is listed as a bottleneck, the material has historically flowed to the four reactors in series where the second reaction takes place under heat and pressure in the presence of a metal catalyst. This project will add two

additional reactors. Flow from the intermediate tank will either go to the existing four reactors or the two new reactors depending on market demand. The company claims that the reactor will not be operated at the same time since the feed is limited by existing pumps and outlet piping.

Also claimed is that there are several bottlenecks upstream and downstream from the reactors. The company also states that the reactors will not vent to the closed vent system and the only emissions are the fugitive components leaks.

After careful consideration of the information submitted both from your meeting with the review engineer and your letter, I am sorry to inform you that our management did not find the justification to change the method of evaluating PBR increases for your project. However, management did not completely say no but is offering the company the opportunity to provide more documentation about reactor downtime, why the reactors are not bottleneck(s) and increasing process abilities with the new reactors. The addition of new reactors normally equals more emissions than just the fugitives and the company will be given the opportunity to provide actual emissions to new allowables. Please address the downtime that will potentially increase the process abilities and provide more details on bottlenecking (your current submittal addressed several bottlenecks but what is the key or primary bottleneck?). Address the federal requirements for this project.

Management commented that lowering your permit allowable to values that would allow the increases from actuals to allowable to fit under a PBR(s) was one possibility or the company could seek a permit amendment.

Please respond as soon as possible but note that the TCEQ has a three (3) day policy for missing information/deficiencies in our second deficiency email. In accordance with APD policy, I may have to send a deficiency letter if I do not received the requested information by 8 AM Friday December 11, 2015. Also, you can request that your pending project be closed with a deficiency letter if additional time is needed to prepare a response. The deficiency letter will allow up to six (6) months for a response, and there are no additional fees for the deficiency letter.

If you have any questions, call me at the telephone number listed below.

Sincerely,

John C. Gott, P.E.  
Texas Commission on Environmental Quality Air Permits Division Rule Registration Section  
512-239-1238  
John.Gott@tceq.texas.gov

John Gott

---

**From:** John Gott  
**Sent:** Monday, December 07, 2015 4:36 PM  
**To:** 'Mark W Strohbeck'; Samuel Short  
**Cc:** jarreola@waid.com; Kristyn Bower; Richard E Hare  
**Subject:** RE: Proposed PBR 136896 to add reactors and piping - request for extension for response

Dear Mr. Strohbeck:

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After careful consideration of the information submitted both from your meeting with the review engineer and your letter, I am sorry to inform you that our management did not find the justification to change the method of evaluating PBR increases for your project. However, management did not completely say no but is offering the company the opportunity to provide more documentation about reactor downtime, why the reactors are not bottleneck(s) and increasing process abilities with the new reactors. The addition of new reactors normally equals more emissions than just the fugitives and the company will be given the opportunity to provide actual emissions to new allowables. Please address the downtime that will potentially increase the process abilities and provide more details on bottlenecking (your current submittal addressed several bottlenecks but what is the key or primary bottleneck?). Address the federal requirements for this project.

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If you have any questions, call me at the telephone number listed below.

Sincerely,

John C. Gott, P.E.

Texas Commission on Environmental Quality Air Permits Division Rule Registration Section

512-239-1238

[John.Gott@tceq.texas.gov](mailto:John.Gott@tceq.texas.gov)

John Gott

---

**From:** John Gott  
**Sent:** Wednesday, December 02, 2015 7:20 AM  
**To:** Kristyn Bower  
**Cc:** Samuel Short  
**Subject:** FW: Proposed PBR 136896 to add reactors and piping - request for extension for response  
**Attachments:** Proposed PBR 136896 - Additional Information.pdf

Dear Kristyn:

They are adding two more reactors. They are claiming only the fugitives from the reactors as the PBR project increase. The new reactors will provide more reactor time for production by increasing the available reactors' potential production time. They claim that they will not increase production or operate the new reactor with the existing reactors. I've asked for our usual actual emissions to new allowables( which are the permitted values since no permitted increases are requested) as the PBR project increase. They do not want to provide and they want to use only the new reactor fugitive emissions as the project increase. I see nothing in this project that would justify that we calculate the PBR increases differently from how we normally calculate them.

I stated that they will need to consider federal netting (calculated in the same way as PBR increases) but I think they are just concentrating on the reactor fugitive increase only. I told them if they want to reduce their permit allowable then this project could be accomplish by a PBR claim. They did not want to consider.

I need management sign-off to tell them their proposal is not an acceptable method to calculate a PBR project increase.

Sincerely,

John C. Gott, P.E.  
Texas Commission on Environmental Quality Air Permits Division Rule Registration Section  
512-239-1238  
[John.Gott@tceq.texas.gov](mailto:John.Gott@tceq.texas.gov)

-----Original Message-----

**From:** Mark W Strohbeck [[mailto:mark\\_w\\_strohbeck@huntsman.com](mailto:mark_w_strohbeck@huntsman.com)]  
**Sent:** Tuesday, December 01, 2015 5:30 PM  
**To:** Samuel Short; John Gott  
**Cc:** [jarreola@waid.com](mailto:jarreola@waid.com); Kristyn Bower; Richard E Hare  
**Subject:** RE: Proposed PBR 136896 to add reactors and piping - request for extension for response

Mr. Short, Mr. Gott,

Please find attached additional information for PBR No. 136896 as requested during our meeting of November 19th.

(See attached file: Proposed PBR 136896 - Additional Information.pdf)

Mark W. Strohbeck  
Huntsman Petrochemical LLC  
Conroe Plant

936-760-6224 (voice)  
936-760-6280 (fax)

From: John Gott <[john.gott@tceq.texas.gov](mailto:john.gott@tceq.texas.gov)>  
To: Mark W Strohbeck <[mark\\_w\\_strohbeck@huntsman.com](mailto:mark_w_strohbeck@huntsman.com)>,  
Cc: Richard E Hare <[richard\\_e\\_hare@huntsman.com](mailto:richard_e_hare@huntsman.com)>,  
"jarreola@waid.com" <[jarreola@waid.com](mailto:jarreola@waid.com)>, Kristyn Bower  
<[Kristyn.Bower@tceq.texas.gov](mailto:Kristyn.Bower@tceq.texas.gov)>  
Date: 11/24/2015 07:57 AM  
Subject: RE: Proposed PBR 136896 to add reactors and piping - request  
for extension for response

Dear Mr. Strohbeck:

Extension granted until 0800 Wednesday December 2, 2015.

Sincerely,

John C. Gott, P.E.  
Texas Commission on Environmental Quality Air Permits Division Rule Registration Section  
512-239-1238  
[John.Gott@tceq.texas.gov](mailto:John.Gott@tceq.texas.gov)

-----Original Message-----

From: Mark W Strohbeck [[mailto:mark\\_w\\_strohbeck@huntsman.com](mailto:mark_w_strohbeck@huntsman.com)]  
Sent: Monday, November 23, 2015 4:47 PM  
To: John Gott  
Cc: Richard E Hare; [jarreola@waid.com](mailto:jarreola@waid.com)  
Subject: Proposed PBR 136896 to add reactors and piping - request for extension for response

Mr. Gott,

Huntsman Petrochemical LLC - Conroe Plant requests an extension to respond to your request for more information on proposed PBR 136896 until December 2, 2015. As you know from our meeting last Thursday afternoon, Huntsman's primary assertion is that there is no potential for a production increase resulting from this project. At your suggestion, I drafted a letter stating our case but unfortunately, because of the holiday week, all of our subject matter experts are on vacation. I do not want to forward a letter without proper review. If we could have next Monday and Tuesday for review we can have a response to you by next Wednesday.

Thank you for your consideration.

Mark W. Strohbeck  
Huntsman Petrochemical LLC  
Conroe Plant  
936-760-6224 (voice)



936-760-6280 (fax)

# HUNTSMAN

Enriching lives through innovation

December 1, 2015

Mr. Samuel Short  
Office of Permitting, Remediation, and Registration  
Building C  
12100 Park 35 Circle  
Austin, Texas 78753

EMAILED

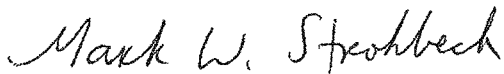
Re: Huntsman Petrochemical LLC - Conroe Plant  
Conroe, Montgomery County  
Permit by Rule 30 TAC §106.261 and §106.262 Registration and Certification  
New SAU Reactors Project – PBR No. 136896  
Regulated Entity Number: RN100219740  
Customer Reference Number: CN603603093

Dear Mr. Short,

Huntsman Petrochemical, LLC, is submitting the enclosed additional information for PBR No. 136896 to address the notice of deficiency email sent by John Gott, P.E. on November 16th, 2015.

If you have any questions, please feel free to contact me at (936) 760-6224 or [mark\\_w\\_strohbeck@huntsman.com](mailto:mark_w_strohbeck@huntsman.com).

Sincerely,



Mark Strohbeck  
Staff Environmental Specialist

Enclosure

cc: John Gott, TCEQ, Air Permits Division, Austin, TX w/enclosure

**Proposed PBR No. 136896 – Additional Information E-mail Request**

Huntsman Petrochemical LLC – Conroe plant (Huntsman Conroe) recently installed two new reactors in our Specialty Amines Unit (SAU). The project results in a potential fugitive emissions increase from the addition of piping components. The project meets the requirements of 30 TAC 106.261 and 262. As such, Huntsman submitted a PI-7-CERT with supporting documentation received by the TCEQ on November 2, 2015. The registration was submitted within 10 days of the change as required by rule.

Mr. John Gott emailed a deficiency notice on November 16, 2015 requesting information to determine if additional emission increases would occur from the project. Huntsman does not believe that any additional emissions result from the installation of the new reactors other than the component additions evaluated in the initial submittal. A detailed discussion of the project follows.

**Background**

Huntsman Conroe is a specialty chemical plant with multiple units designed to produce different families of chemicals. The production rate is limited by the design of the equipment and impacted by market demand. The SAU, makes two different families of products depending on market demand: methylated amines including ZF10, ZF20 and DMAEE and non-methylated including APM, DMAPA, MOPA, and APDEA. These two families require different catalyst. The removal of the catalyst is a labor intensive job with significant safety and environmental concerns. The removal procedure causes degradation to the catalyst and creates the potential to damage equipment.

In order to alleviate these issues, two new reactors have been added to the unit. The existing reactors and the new reactors cannot be operated at the same time. Each set of reactors are dedicated to a single product family. Production is limited by upstream and downstream equipment, which remains unchanged.

**Equipment Operating Limits**

The SAU feeds raw material to a low pressure reactor system. The low pressure reactor section consists of heat exchangers and recirculating tanks where chemicals react spontaneously without the need of catalyst. The reacted material from this section flows into an intermediate storage tank. This section is currently a bottleneck to the overall process and was not modified by this project.

From the intermediate tank, the material has historically flowed to four reactors in series where a second reaction takes place under heat and pressure in the presence of metal catalyst. This project added two additional reactors that will be maintained with a separate catalyst. Flow from the intermediate tank will either go to the existing four reactors or the two new reactors depending on market demand. The reactors will not be operated at the same time since the feed is limited by existing pumps and outlet piping. The reactors do not vent directly to the closed vent system (CVS) and are not a source of emissions with the exception of potential equipment leaks from components.

From the reactors material flows into the existing separator which releases pressure and vents mostly hydrogen to the flare. The throughput and composition of material to the separator will not change as a result of the project. From the separator the material flows into a series of towers which recycles some of the material back to the low pressure reactor system, removes lights to the flare and heavies to waste storage. The separation system is an additional bottleneck to the process limiting production. The separation system was not modified by this project.

### **Summary**

As stated above, the new reactors do not have the potential to increase production, either on a short-term or long-term basis. Production is limited by the low pressure reactor section and the separation section. There is no potential increase in actual or allowable emissions from the process as a result of this project. The reactors were installed solely to reduce degradation of the catalyst, to minimize labor and to reduce potential safety and environmental issues. Based on the information provided, Huntsman believes that the project meets the requirements of the PBR and requests approval of the referenced registration.

John Gott

---

**From:** Mark W Strohbeck <mark\_w\_strohbeck@huntsman.com>  
**Sent:** Tuesday, December 01, 2015 5:30 PM  
**To:** Samuel Short; John Gott  
**Cc:** jarreola@waid.com; Kristyn Bower; Richard E Hare  
**Subject:** RE: Proposed PBR 136896 to add reactors and piping - request for extension for response  
**Attachments:** Proposed PBR 136896 - Additional Information.pdf

Mr. Short, Mr. Gott,

Please find attached additional information for PBR No. 136896 as requested during our meeting of November 19th.

(See attached file: Proposed PBR 136896 - Additional Information.pdf)

Mark W. Strohbeck  
Huntsman Petrochemical LLC  
Conroe Plant  
936-760-6224 (voice)  
936-760-6280 (fax)

From: John Gott <[john.gott@tceq.texas.gov](mailto:john.gott@tceq.texas.gov)>  
To: Mark W Strohbeck <[mark\\_w\\_strohbeck@huntsman.com](mailto:mark_w_strohbeck@huntsman.com)>,  
Cc: Richard E Hare <[richard\\_e\\_hare@huntsman.com](mailto:richard_e_hare@huntsman.com)>,  
"jarreola@waid.com" <[jarreola@waid.com](mailto:jarreola@waid.com)>, Kristyn Bower  
<[Kristyn.Bower@tceq.texas.gov](mailto:Kristyn.Bower@tceq.texas.gov)>  
Date: 11/24/2015 07:57 AM  
Subject: RE: Proposed PBR 136896 to add reactors and piping - request  
for extension for response

Dear Mr. Strohbeck:

Extension granted until 0800 Wednesday December 2, 2015.

Sincerely,

John C. Gott, P.E.  
Texas Commission on Environmental Quality Air Permits Division Rule Registration Section  
512-239-1238  
[John.Gott@tceq.texas.gov](mailto:John.Gott@tceq.texas.gov)

-----Original Message-----

From: Mark W Strohbeck [[mailto:mark\\_w\\_strohbeck@huntsman.com](mailto:mark_w_strohbeck@huntsman.com)]  
Sent: Monday, November 23, 2015 4:47 PM

To: John Gott

Cc: Richard E Hare; [jarreola@waid.com](mailto:jarreola@waid.com)

Subject: Proposed PBR 136896 to add reactors and piping - request for extension for response

Mr. Gott,

Huntsman Petrochemical LLC - Conroe Plant requests an extension to respond to your request for more information on proposed PBR 136896 until December 2, 2015. As you know from our meeting last Thursday afternoon, Huntsman's primary assertion is that there is no potential for a production increase resulting from this project. At your suggestion, I drafted a letter stating our case but unfortunately, because of the holiday week, all of our subject matter experts are on vacation. I do not want to forward a letter without proper review. If we could have next Monday and Tuesday for review we can have a response to you by next Wednesday.

Thank you for your consideration.

Mark W. Strohbeck  
Huntsman Petrochemical LLC  
Conroe Plant  
936-760-6224 (voice)  
936-760-6280 (fax)

# HUNTSMAN

Enriching lives through innovation

December 1, 2015

Mr. Samuel Short  
Office of Permitting, Remediation, and Registration  
Building C  
12100 Park 35 Circle  
Austin, Texas 78753

EMAILED

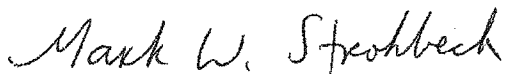
Re: Huntsman Petrochemical LLC - Conroe Plant  
Conroe, Montgomery County  
Permit by Rule 30 TAC §106.261 and §106.262 Registration and Certification  
New SAU Reactors Project – PBR No. 136896  
Regulated Entity Number: RN100219740  
Customer Reference Number: CN603603093

Dear Mr. Short,

Huntsman Petrochemical, LLC, is submitting the enclosed additional information for PBR No. 136896 to address the notice of deficiency email sent by John Gott, P.E. on November 16th, 2015.

If you have any questions, please feel free to contact me at (936) 760-6224 or [mark\\_w\\_strohbeck@huntsman.com](mailto:mark_w_strohbeck@huntsman.com).

Sincerely,



Mark Strohbeck  
Staff Environmental Specialist

Enclosure

cc: John Gott, TCEQ, Air Permits Division, Austin, TX w/enclosure

**Proposed PBR No. 136896 – Additional Information E-mail Request**

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**Background**

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From the intermediate tank, the material has historically flowed to four reactors in series where a second reaction takes place under heat and pressure in the presence of metal catalyst. This project added two additional reactors that will be maintained with a separate catalyst. Flow from the intermediate tank will either go to the existing four reactors or the two new reactors depending on market demand. The reactors will not be operated at the same time since the feed is limited by existing pumps and outlet piping. The reactors do not vent directly to the closed vent system (CVS) and are not a source of emissions with the exception of potential equipment leaks from components.



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### **Summary**

As stated above, the new reactors do not have the potential to increase production, either on a short-term or long-term basis. Production is limited by the low pressure reactor section and the separation section. There is no potential increase in actual or allowable emissions from the process as a result of this project. The reactors were installed solely to reduce degradation of the catalyst, to minimize labor and to reduce potential safety and environmental issues. Based on the information provided, Huntsman believes that the project meets the requirements of the PBR and requests approval of the referenced registration.

John Gott

---

**From:** Mark W Strohbeck <mark\_w\_strohbeck@huntsman.com>  
**Sent:** Tuesday, November 24, 2015 11:23 AM  
**To:** John Gott  
**Cc:** jarreola@waid.com; Kristyn Bower; Richard E Hare  
**Subject:** RE: Proposed PBR 136896 to add reactors and piping - request for extension for response

Thank you.

Mark W. Strohbeck  
Huntsman Petrochemical LLC  
Conroe Plant  
936-760-6224 (voice)  
936-760-6280 (fax)

From: John Gott <[john.gott@tceq.texas.gov](mailto:john.gott@tceq.texas.gov)>  
To: Mark W Strohbeck <[mark\\_w\\_strohbeck@huntsman.com](mailto:mark_w_strohbeck@huntsman.com)>,  
Cc: Richard E Hare <[richard\\_e\\_hare@huntsman.com](mailto:richard_e_hare@huntsman.com)>,  
"jarreola@waid.com" <[jarreola@waid.com](mailto:jarreola@waid.com)>, Kristyn Bower  
<[Kristyn.Bower@tceq.texas.gov](mailto:Kristyn.Bower@tceq.texas.gov)>  
Date: 11/24/2015 07:57 AM  
Subject: RE: Proposed PBR 136896 to add reactors and piping - request  
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Dear Mr. Strohbeck:

Extension granted until 0800 Wednesday December 2, 2015.

Sincerely,

John C. Gott, P.E.  
Texas Commission on Environmental Quality Air Permits Division Rule Registration Section  
512-239-1238  
[John.Gott@tceq.texas.gov](mailto:John.Gott@tceq.texas.gov)

-----Original Message-----

From: Mark W Strohbeck [[mailto:mark\\_w\\_strohbeck@huntsman.com](mailto:mark_w_strohbeck@huntsman.com)]  
Sent: Monday, November 23, 2015 4:47 PM  
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Cc: Richard E Hare; [jarreola@waid.com](mailto:jarreola@waid.com)  
Subject: Proposed PBR 136896 to add reactors and piping - request for extension for response

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Thank you for your consideration.

Mark W. Strohbeck  
Huntsman Petrochemical LLC  
Conroe Plant  
936-760-6224 (voice)  
936-760-6280 (fax)

John Gott

---

**From:** John Gott  
**Sent:** Tuesday, November 24, 2015 7:57 AM  
**To:** 'Mark W Strohbeck'  
**Cc:** Richard E Hare; jarreola@waid.com; Kristyn Bower  
**Subject:** RE: Proposed PBR 136896 to add reactors and piping - request for extension for response

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Sincerely,

John C. Gott, P.E.  
Texas Commission on Environmental Quality Air Permits Division Rule Registration Section  
512-239-1238  
[John.Gott@tceq.texas.gov](mailto:John.Gott@tceq.texas.gov)

-----Original Message-----

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Cc: Richard E Hare; [jarreola@waid.com](mailto:jarreola@waid.com)  
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Mark W. Strohbeck  
Huntsman Petrochemical LLC  
Conroe Plant  
936-760-6224 (voice)  
936-760-6280 (fax)

John Gott

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**From:** Kristyn Bower  
**Sent:** Tuesday, November 24, 2015 7:46 AM  
**To:** John Gott  
**Subject:** RE: Proposed PBR 136896 to add reactors and piping - request for extension for response

I'll leave this one up to you since it is about to be vacation. Personally, I would not give them 5 extra days. That's an entirely new deficiency length. I would probably give them until Monday because of the Holiday.

But again, I'll back you up on whatever you decide for this one.

Thanks,  
Kristyn

-----Original Message-----

**From:** John Gott  
**Sent:** Monday, November 23, 2015 5:03 PM  
**To:** Kristyn Bower  
**Subject:** FW: Proposed PBR 136896 to add reactors and piping - request for extension for response

Dear Kristyn:

Since they asked before the deadline, but I still told him that the answer could be no due to our workload.

Due we grant?

Sincerely,

John C. Gott, P.E.  
Texas Commission on Environmental Quality Air Permits Division Rule Registration Section  
512-239-1238  
[John.Gott@tceq.texas.gov](mailto:John.Gott@tceq.texas.gov)

-----Original Message-----

**From:** Mark W Strohbeck [[mailto:mark\\_w\\_strohbeck@huntsman.com](mailto:mark_w_strohbeck@huntsman.com)]  
**Sent:** Monday, November 23, 2015 4:47 PM  
**To:** John Gott  
**Cc:** Richard E Hare; [jarreola@waid.com](mailto:jarreola@waid.com)  
**Subject:** Proposed PBR 136896 to add reactors and piping - request for extension for response

Mr. Gott,

Huntsman Petrochemical LLC - Conroe Plant requests an extension to respond to your request for more information on proposed PBR 136896 until December 2, 2015. As you know from our meeting last Thursday afternoon, Huntsman's primary assertion is that there is no potential for a production increase resulting from this project. At your suggestion, I drafted a letter stating our case but unfortunately, because of the holiday week, all of our subject matter experts are on

vacation. I do not want to forward a letter without proper review. If we could have next Monday and Tuesday for review we can have a response to you by next Wednesday.

Thank you for your consideration.

Mark W. Strohbeck  
Huntsman Petrochemical LLC  
Conroe Plant  
936-760-6224 (voice)  
936-760-6280 (fax)

John Gott

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**From:** John Gott  
**Sent:** Monday, November 16, 2015 5:17 PM  
**To:** 'jarreola@waid.com'; 'Mark\_W\_Strohbeck@Hunstman.com'  
**Subject:** Proposed PBR 136896 to add reactors and piping.

Dear Ms. Arreola/Mr. Strohbeck:

Thank you for submitted this PBR claim. It helps the economy of Texas.

PBR increases are based upon actual emissions to new allowable emissions. The company is adding reactors which will allow for less down time even though you will not operate the reactors together or in series. Therefore, your actual emissions could increase to your allowables emissions. Recalculate the project increase using this guidance.

Please note that the TCEQ has a five (5) day policy for missing information/deficiencies, and details about such can be found under the Permit Application Voidance Guidelines memo at the following link:

<http://www.tceq.texas.gov/assets/public/permitting/air/memos/voidguide06.pdf> In accordance with APD policy, I may have to send a deficiency letter if I do not received the requested information by 8 AM November 24, 2015. Also, you can request that your pending project be closed with a deficiency letter if additional time is needed to prepare a response. The deficiency letter will allow up to six (6) months for a response, and there are no additional fees for the deficiency letter.

If you have any questions, please call me at the telephone number listed below.

Sincerely,

John C. Gott, P.E.  
Texas Commission on Environmental Quality  
Air Permits Division  
Rule Registration Section  
512-239-1238  
[John.Gott@tceq.texas.gov](mailto:John.Gott@tceq.texas.gov)

## Special Conditions

Permit Number 4788

*Permit Engineer  
Joe Malarcher*

1. This permit authorizes emissions only from those points listed in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates" (MAERT), and the facilities covered by this permit are authorized to emit subject to the emission rate limits on that table and other operating requirements specified in the special conditions.

2. Piping, Valves, Connectors, Pumps, Agitators, and Compressors - 28VHP

Except as may be provided in the special conditions of this permit, the following requirements apply to the above-referenced equipment: **(5/11)**

- A. The requirements of paragraphs F and G shall not apply (1) where the Volatile Organic Compound (VOC) has an aggregate partial pressure or vapor pressure of less than 0.044 pounds per square inch, absolute (psia) at 68°F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list or by one of the methods described below to be made readily available upon request.

The exempted components may be identified by one or more of the following methods:

- (a) piping and instrumentation diagram (PID);
  - (b) a written or electronic database or electronic file;
  - (c) color coding;
  - (d) a form of weatherproof identification; or
  - (e) designation of exempted process unit boundaries.
- B. Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes.
  - C. New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.



D. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by Title 30 Texas Administrative Code Chapter 115 (30 TAC Chapter 115), shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in subparagraph A above. If an unsafe-to-monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe-to-monitor times. A difficult-to-monitor component for which quarterly monitoring is specified may instead be monitored annually.

E. New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.

Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the permit holder must complete either of the following actions within that time period;

- (1) a cap, blind flange, plug, or second valve must be installed on the line or valve; or
- (2) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once by the end of the 72 hours period following the creation of the open ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve.

F. Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer.

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Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. For valves equipped with rupture discs, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown.

A check of the reading of the pressure-sensing device to verify disc integrity shall be performed weekly and recorded in the unit log or equivalent. Pressure-sensing devices that are continuously monitored with alarms are exempt from recordkeeping requirements specified in this paragraph.

The gas analyzer shall conform to requirements listed in Method 21 of 40 CFR part 60, appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs are being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured.

Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service.

- G. Except as may be provided for in the special conditions of this permit, all pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with an automatic seal failure detection and alarm system need not be monitored. These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or

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magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.

- H. Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 parts per million by volume (ppmv) or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. Damaged or leaking pump, compressor, and agitator seals found to be emitting VOC in excess of 2,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within 5 days. Records of the first attempt to repair shall be maintained.
- I. A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging within 15 days of the detection of the leak. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC § 115.782 (c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC § 115.782 (c)(1)(B)(i)(I), the TCEQ Regional Manager and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.
- J. Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95% of

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the instrument readings recorded. Records of physical inspections shall be noted in the operator's log or equivalent.

- K. Alternative monitoring frequency schedules of 30 TAC §§ 115.352 - 115.359 or National Emission Standards for Organic Hazardous Air Pollutants, 40 CFR Part 63, Subpart H, may be used in lieu of Items F through G of this condition.
  - L. Compliance with the requirements of this condition does not assure compliance with requirements of 30 TAC Chapter 115, an applicable New Source Performance Standard (NSPS), or an applicable National Emission Standard for Hazardous Air Pollutants (NESHAPS) and does not constitute approval of alternative standards for these regulations.
- 3. Damaged or leaking pump and compressor seal found to be emitting VOC in excess of 500 ppmv or found by visual inspection to be leaking (e.g. dripping process fluids) shall be tagged and replaced or repaired. This condition supersedes, and shall be used in lieu of, the pump and compressor seal specifications found in Special Condition No. 2H.
  - 4. In lieu of the unit log, Huntsman may keep records of the weekly pressure-sensing device readings required in Special Condition No. 2F in any on-site location as long as they are maintained in a current and complete condition and are made available upon request of TCEQ representatives or any local air pollution control program having jurisdiction.
  - 5. In addition to the weekly physical inspection required by Item E of Special Condition No. 2, all accessible valve associated connectors in gas/vapor and light liquid service and all accessible connectors in Ethylene Oxide (ETO) service shall be monitored quarterly with an approved gas analyzer in accordance with Items F through J of Special Condition No. 2.
    - A. Connectors may be monitored on a semiannual basis if the percent of connectors leaking for two consecutive quarterly monitoring periods is less than 0.5 percent.

Connectors may be monitored on an annual basis if the percent of connectors leaking for two consecutive semiannual monitoring periods is less than 0.5 percent.

If the percent of connectors leaking for any semiannual or annual

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monitoring period is 0.5 percent or greater, the facility shall revert to quarterly monitoring until the facility again qualifies for the alternative monitoring schedules previously outlined in this paragraph.

- B. The percent of connectors leaking used in paragraph A shall be determined using the following formula:

$$(Cl + Cs) \times 100 / Ct = Cp$$

Where:

Cl = the number of connectors found leaking by the end of the monitoring period, either by Method 21 or sight, sound, and smell.

Cs = the number of connectors for which repair has been delayed and are listed on the facility shutdown log.

Ct = the total number of connectors in the facility subject to the monitoring requirements, as of the last day of the monitoring period, not including nonaccessible and unsafe-to-monitor connectors.

Cp = the percentage of leaking connectors for the monitoring period.

6. Piping, Valves, Pumps, and Compressors in Ammonia (NH<sub>3</sub>) Service

- A. Audio, olfactory, and visual checks for NH<sub>3</sub> leaks within the operating area shall be made each 12-hour shift by operator walk-through.
- B. Immediately, but no later than one hour upon detection of a leak, plant personnel shall take the following actions:
- (1) Isolate the leak.
  - (2) Commence repair or replacement of the leaking component.
  - (3) Use a leak collection/containment system to prevent the leak until repair or replacement can be made if immediate repair is not possible.

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Date and time of each inspection shall be noted in the operator's log or equivalent. Records shall be maintained at the plant site of all repairs and replacements made due to leaks. These records shall be made available to representatives of the TCEQ upon request.

### 7. Piping, Valves, Pumps, and Compressors in Heavy Liquid Service (5/11)

- A. Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable ANSI, API, ASME, or equivalent codes.
- B. New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical.
- C. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Non-accessible valves, as defined in 30 TAC Chapter 115, shall be identified in a list to be made available upon request.
- D. New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter.

Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve. Except during sampling, the second valve shall be closed.

- E. All piping components shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.
- F. Damaged or leaking valves, connectors, compressor seals, and pump seals found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. Every reasonable effort shall be made to repair a leaking component as specified in this paragraph within 15 days after the leak is found. If the repair of a component would require a unit shutdown, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging. At the discretion of the TCEQ Executive Director or designated representative, early unit shutdown or other appropriate action may be required based on the

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number and severity of tagged leaks awaiting shutdown.

- G. Date and time of each inspection shall be noted in the operator's log or equivalent. Records shall be maintained at the plant site of all repairs and replacements made due to leaks. These records shall be made available to representatives of the TCEQ upon request.
- 8. The primary high-pressure  $\text{NH}_3$  pump located in the JEFFAMINE ® Units I and III shall have double-packed stuffing boxes or equivalent emission control technology.
- 9. A rupture disc shall be installed upstream of each gas/vapor, light liquid, and heavy liquid (if the vapor pressure is greater than 0.002 psia) relief valve in the JEFFAMINE ® Unit III that vents directly to the atmosphere. In addition, a rupture disc shall be installed upstream of each relief valve that vents directly to the atmosphere on the Carbonate Unit 1.
- 10. Annual production is limited to the rates represented in the Table 2 Material Balance submitted in the confidential section of the permit amendment application dated May 26, 2006.
- 11. Storage tanks are subject to the following requirements. The control requirements specified in paragraphs A-D of this condition shall not apply (1) where the VOC has an aggregate partial pressure of less than 0.50 psia at the maximum feed temperature or 95°F, whichever is greater, or (2) to storage tanks smaller than 25,000 gallons or (3) Parts A through D do not apply to fixed-roof tanks.
  - A. An internal floating deck or "roof" or equivalent control shall be installed in all tanks. The floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the internal floating roof: (1) a liquid-mounted seal, (2) two continuous seals mounted one above the other, or (3) a mechanical shoe seal.
  - B. An open-top tank containing a floating roof (external floating roof tank) which uses double seal or secondary seal technology shall be an approved control alternative to an internal floating roof tank provided the primary seal consists of either a mechanical shoe seal or a liquid-mounted seal and the secondary seal is rim-mounted. A weathershield is not approvable as a secondary seal unless specifically reviewed and determined to be vapor-tight.

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- C. For any tank equipped with a floating roof, the permit holder shall perform the visual inspections and seal gap measurements as specified in 40 CFR § 60.113b, Testing and Procedures (as amended at 54 FR 32973, Aug. 11, 1989), to verify fitting and seal integrity. Records shall be maintained of the dates seals were inspected and seal gap measurements made, results of inspections and measurements made (including raw data), and actions taken to correct any deficiencies noted.
  - D. The floating roof design shall incorporate sufficient flotation to conform to the requirements of API Code 650 dated November 1, 1998, except that an internal floating cover need not be designed to meet rainfall support requirements and the materials of construction may be steel or other materials.
  - E. Uninsulated tank exterior surfaces exposed to the sun shall be white or aluminum. Storage tanks must be equipped with permanent submerged fill pipes.
  - F. The permit holder shall maintain a record of tank throughput for the previous month and the past consecutive 12-month period for each tank.
- 12. Atmospheric storage tanks and loading operation must comply with the attached "Approved Chemical List."
  - 13. Ethylene oxide, dimethylamine, monomethylamine, ammonia, and Acrylonitrile vapors from tank truck and/or railcar unloading shall be directed by a vapor line from facility storage vessels to the tank truck and/or railcar. It is not permissible except under emergency conditions to vent waste gases directly to the atmosphere; however, emergency emissions are not permitted.
  - 14. Upon completion of the tank truck and/or railcar unloading of the reactants listed in Special Condition No. 13, the unloading lines shall not be vented directly to the atmosphere except under emergency conditions; however, emergency emissions are not permitted. If vapor lines are depressurized, the waste gases shall be nitrogen (N<sub>2</sub>) purged to a water scrubber with a control efficiency of no less than 90 percent or to the Plant Flare (EPN RA22). If liquid lines are depressurized, the lines shall first be purged of liquid; and the remaining vapor shall be N<sub>2</sub> purged to a water scrubber with a control efficiency of not less than 90 percent or to the plant Flare (EPN RA22).
  - 15. All tank trucks loaded must comply with all applicable tank truck inspection



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requirements as defined in 30 TAC § 115.214 and 49 CFR § 180.407(h). The permittee shall not allow any applicable tank truck to be filled unless the tank has passed a leak-tight test within the last year as evidenced by a prominently displayed certification affixed near the Department of Transportation certification plate which shows:

- A. The date the tank truck last passed the leak-tight test required by this condition, and
  - B. The identification number of the tank truck.
16. All loading of materials on the "Approved Chemical List," which have a vapor pressure greater than 0.0002 psia at loading condition, shall be loaded either through:
- A. Submerged fill pipe, or
  - B. Splash loading is acceptable if the loading vapors are collected with a minimum efficiency of 65 percent and are routed to a control device with a minimum 95 percent removal efficiency or minimum 98 percent destruction efficiency, or
  - C. Splash loading is acceptable for the chemicals are viscous liquids that would create substantial clingage and drips.
17. Butylene oxide storage shall be limited to vessels with a design maximum operating pressure of at least 90 psig, ethylene oxide (ETO) storage shall be limited to vessels with a design maximum operating pressure of at least 65 psig, and propylene oxide storage shall be limited to vessels with a design maximum operating pressure of at least 7 psig.
18. Operation without visible liquid leaks or spills shall be maintained at all loading/unloading facilities. This does not apply to momentary dripping associated with the initial connection or disconnection of fittings. Sustained dripping from fittings during loading/unloading operations is not permitted. Any liquid spill that occurs during loading/unloading activities shall be cleaned up immediately to minimize air emissions. This condition applies only to materials with a vapor pressure greater than 0.0002 psia at loading conditions.
19. Ethylene oxide unloading vapor lines shall be purged after unloading operations are completed. Purge shall be vented to Scrubber F-E-30.

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20. Emissions resulting from butylene oxide unloading shall be collected and routed to Thermal Oxidizer (EPN RE-22).
21. All emissions generated by materials requiring controlled loading as listed in the attached "Approved Chemical List" shall be sent to the Loading Incinerator (EPN RE22). The Loading Incinerator firebox exit temperature shall be continuously monitored and recorded during all controlled loading operations, and the minimum firebox chamber temperature shall be 1500°F. The loading incinerator shall have a VOC destruction efficiency of greater than 99 percent.
22. During facility equipment washout between amine production runs, the AAU and SAU units shall be vented to a control device until the total organic carbon content of the liquids is verified to be less than 1,000 ppmw.
23. Flares shall be designed and operated in accordance with the following requirements:
  - A. Under normal and planned maintenance flow conditions, each flare system shall be designed such that the combined assist gas and waste stream to each flare meets the 40 CFR § 60.18 specifications. **(01/08)**

The heating value or hydrogen content and velocity requirements shall be satisfied during operations authorized by this permit. Flare testing per 40 CFR § 60.18(f) may be requested by the appropriate TCEQ Regional Office to demonstrate compliance with these requirements.
  - B. The flare shall be operated with a flame present at all times and/or have a constant pilot flame. The pilot flame shall be continuously monitored by a thermocouple or an infrared monitor. The time, date, and duration of any loss of pilot flame shall be recorded. Each monitoring device shall be accurate to, and shall be calibrated at a frequency in accordance with, the manufacturer's specifications.
  - C. The flare shall be operated with no visible emissions except periods not to exceed a total of five minutes during any two consecutive hours.
  - D. The permit holder shall install continuous flow monitors that provide a record of the vent stream flow to the flare for flares RF-60 and RA-22 Main tip and AMU tip. The flow monitors shall be installed such that the total vent stream flows to the flare are measured. The permit holder shall also install hydrogen flow meters to continuously demonstrate that

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sufficient hydrogen is present when the RF-60 flare or the RA-22 flare Main tip are operating as a hydrogen flare. For the RA-22 flare Main tip, the hydrogen flow rate may be measured as the feed rate of hydrogen to the JAU units. Readings shall be taken at least once every 15 minutes and the average hourly values of the flow shall be recorded each hour.

The accuracy of each flow monitor required by this section shall be verified on an annual basis to meet the following accuracy specifications: the flow monitor shall be  $\pm 5.0$  percent, temperature monitor shall be  $\pm 2.0$  percent at absolute temperature, and pressure monitor shall be  $\pm 5.0$  mm Hg.

When using natural gas enrichment, the minimum net heating value of the gas sent to the flare shall be 200 British thermal units/standard cubic foot of the gas. The permittee shall maintain natural gas enrichment of the following waste gas streams:

- (1) the low-pressure waste gas controlled by EPN RA-22 and
- (2) the waste gas controlled by EPN RF-60.

When using natural gas enrichment, the natural gas enrichment shall be no less than 20 percent by volume of the total waste gas stream. Readings of the natural gas enrichment flow shall be taken at least once every 15 minutes and the average hourly values shall be recorded each hour.

The hydrogen gas content of the RF-60 flare and the RA-22 Main Tip shall be no less than 8 percent by volume of the total waste gas stream when natural gas enrichment is not utilized. The hydrogen gas content shall be recorded, or calculated using the vent flow rate data and the hydrogen flow rate data, at least once every 15 minutes and the average hourly values shall be recorded each hour.

The monitors shall operate as required by this section at least 95 percent of the time when the flare is operational, averaged over a rolling 12-month period. Actual exit velocity determined in accordance with 40 CFR § 60.18(f)(4) shall be recorded at least once every 15 minutes. Hourly mass emission rates shall be determined and recorded using the above readings and the emission factors used in the permit amendment application, PI1 dated May 26, 2006. **(05/15)**

24. Non-fugitive emissions from relief valves, safety valves, or rupture discs of gases

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containing VOC at a concentration of greater than 1 percent are not authorized by this permit unless authorized on the MAERT. Any releases directly to atmosphere from relief valves, safety valves, or rupture discs of gases containing VOC at a concentration greater than 1 weight percent are not consistent with good practice for minimizing emissions, with the exception of those listed below:

- A. Stack analyzer vents.
  - B. Safety relief valves that discharge to the atmosphere only as a result of fire or failure of utilities.
  - C. Relief valves in the Specialty Amines Unit and storage tank area.
  - D. Reactor F-G-55 when using a formaldehyde mixture as a raw material.
  - E. The 11 Relief Valves (F-A-42, F-B-108, F-C-46, F-C-64, F-C-65, F-B-11, F-B-23, F-B-33, F-B-34, F-B-47, and F-B-64) and steam jet exhausts on these units.
25. Tanks T-E42, T-E43, T-E68, T-E69, T-E107, T-E109, T-E115, and T-E126 shall be vented to a scrubber. The scrubbers shall have a removal efficiency of at least 90 percent for DMAPA and DMEA.
26. Tanks T-B-4 and T-B-5 shall be vented to a flare meeting the requirements of Special Condition No. 23.
27. Tanks T-E-74 or T-E-75 shall not be simultaneously loaded. Tanks T-E-74, T-E-75 and T-E-116 shall be controlled by scrubber. The scrubbers shall have a removal efficiency of at least 90 percent.
28. Reactor oxide purge and depressurization operations associated with Reaction Trains F-G-1, F-G-51, and F-G-55 shall be routed through Caustic Scrubber (F-G-32) then to Flare (EPN RF-60) while the reactors are venting under positive pressure. Reactor F-G-55 is excluded from this requirement when using a formaldehyde mixture as a raw material. Reactor oxide purge and depressurization operations associated with Reaction Trains F-D-1, F-D-2, F-D-19, F-D-26, F-D-27, and F-D-24 (when used as a reactor) shall be routed through Caustic Scrubber (F-D-42) then to Flare (EPN RF-60) while the reactors are venting under positive pressure. Neutralizer and reactor venting under negative pressure shall be vented to the Flare (EPN RF-60). The average hourly temperature of the scrubbing solution entering the Caustic Scrubbers (F-G-32

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and F-D-42) shall not exceed 125°F. The temperature shall be continuously monitored and recorded while the reaction trains are operation except when maintenance is performed on the monitoring or recording equipment. The allowable monitor or recording equipment downtime shall not exceed five percent of the annual operating time of the reaction trains. **(05/15)**

29. The cooling tower water shall be monitored monthly for VOC leakage from heat exchangers in accordance with the requirements of the TCEQ Sampling Procedures Manual, Appendix P (dated January 2003 or a later edition), or another air stripping method approved by the TCEQ Executive Director.

For all sampling required by this condition, the sample port for the water returning from the heat exchangers to the cooling tower shall be located on the top of the horizontal section of the water line returning to the cooling tower. The minimum detection level of the overall testing system shall be no greater than 0.15 ppmw VOC (concentration VOC in water entering the cooling tower). The minimum detection limit for the air stripped VOC shall be no greater than 2.50 ppmv (concentration VOC in the stripping air). Calibration standards shall include at least zero ppmv and 10 ppmv VOC in air (as methane). Cooling water VOC concentrations above 0.08 ppmw indicate faulty equipment. Equipment shall be maintained so as to minimize VOC emissions into the cooling water. Faulty equipment shall be repaired at the earliest opportunity but no later than the next scheduled shutdown of the process unit in which the leak occurs.

Emissions from the cooling tower are not authorized if the VOC concentration of the water returning to the cooling tower exceeds 0.8 ppmw. The VOC concentrations above 0.8 ppmw are not subject to extensions for delay of repair under this permit condition. The results of the monitoring and maintenance efforts shall be recorded.

Compliance of Special Conditions No. 29 is required within 90 days of permit issuance.

30. The facility records shall include the following:
- A. Daily and annual production records speciated by product in units of pounds per day and pounds per year. Annual production shall be based on a 12-month rolling total.
  - B. Daily and annual loading records speciated by product. Records shall include the date, quantity loaded, loading temperature, vapor pressure at

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the loading temperature, and loading control used. Annual loading rates shall be based on a 12-month rolling total.

- C. The results of cooling tower monitoring and maintenance efforts.
  - D. The records of flare(s) operation as required by Special Condition No. 23.
  - E. Results of fugitive monitoring per Special Condition Nos. 2, 3, 4, 5, and 6.
31. The permit holder shall also make and maintain record of the material stored in tanks authorized by this permit. The record shall include the name of the compound stored, the molecular weight and vapor pressure of the compound, and the temperature at which the material was stored.

All records shall be kept on-site in a current and complete condition and shall be made available upon request of TCEQ representatives or any local air pollution control program having jurisdiction. All records shall be retained for at least two years from the date upon which they were made.

32. Except as provided for below, the use of compounds at the facilities authorized by this permit is limited to those identified in the attached "Approved Chemical List" and compounds with a vapor pressure less than 0.0002 psia. New compounds may be added through the use of the procedure below, 30 TAC Chapter 106, or 30 TAC Chapter 116.
- A. Short-term (pounds per hour [lb/hr]) and annual (TPY) emissions and calculations shall be completed for each chemical at each affected source. Emission rates (ER) shall be calculated in accordance with the following methods, as documented in the permit amendment application PI-1 dated May 26, 2006: AP-42 emission factors and equations to determine tank and loading emissions; TCEQ fugitive emission factors with appropriate control as identified in the guidance document, "Equipment Leak Fugitives" to determine piping fugitive emissions. The calculated ER shall not exceed the maximum allowable emissions rate at any emission point.
  - B. The Effect Screening Level (ESL) for the material shall be obtained from the current TCEQ ESL list or by written request to the TCEQ Toxicology Section.
  - C. The total emissions of any compound from all emission points in this permit must satisfy one of the following conditions:

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- (1) The total maximum ER from all sources is less than 0.04 lb/hr and the ESL greater than 2  $\mu\text{g}/\text{m}^3$ ; or

- (2) In the simplest case, for only one emission point,

$$(\text{ER}/\text{ESL})_N \leq (\text{ER}/\text{ESL})_E$$

$$(\text{ER}/\text{ESL})_N = \begin{array}{l} \text{maximum hourly ER of new compound(s)} \\ \text{divided by its ESL} \end{array}$$

$$(\text{ER}/\text{ESL})_E = \begin{array}{l} \text{the highest ratio of any previously authorized} \\ \text{compounds hourly ER divided by its ESL} \end{array}$$

- (3) For a generic modeling method:

The maximum off-property, ground level concentrations (GLC) for each compound shall be determined using the method below. The term "generic" refers to emission rate calculations and modeling performed for the permit application dated May 26, 2006.

The following equation presents the ratio testing procedure for a given compound "i" from a given emission source "j":

$$\text{GLC}_{\max}(i,j) =$$

where:

$$\text{GLC}_{\max}(i,j) = \begin{array}{l} \text{maximum one hour GLC in } \mu\text{g}/\text{m}^3 \text{ of chemical} \\ \text{compound "i" due to emissions from source, "j"} \end{array}$$

$$X_{G,\max}(j) = \begin{array}{l} \text{maximum one hour generic GLC due to emissions} \\ \text{from source "j"} \end{array}$$

$$E(i,j) = \begin{array}{l} \text{actual emissions in lb/hr for chemical compound "i"} \\ \text{from source "j"} \end{array}$$

$$E_G(j) = \begin{array}{l} \text{generic emission rates in lb/hr used for source "j"} \end{array}$$

$$\sum \text{GLC}_{\max}(i,j)$$

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The maximum predicted GLC of compound "i" is determined by summing the contributions from all emission sources on the site:

$$GLC_{\max}(i) =$$

where:

$GLC_{\max}(i)$  = maximum GLC in  $\mu\text{g}/\text{m}^3$  of chemical compound i

$\sum GLC_{\max}(i, j)$  = sum of maximum one-hour GLC of chemical i from all sources

This value must be verified to be less than two times the ESL (if a nonindustrial receptor could also limit emissions). If the maximum predicted GLC for the compound is greater than the ESL, the concentration at the nearest non-industrial receptor shall be determined using the method found in the permit application dated May 26, 2006. The GLC at the nearest non-industrial receptor shall not exceed the ESL.

D. The permit holder shall maintain records of the information below and the demonstrations in steps A through C above. The following documentation is required for each compound:

- (1) Chemical name(s), composition, and chemical abstract registry number if available.
- (2) True vapor pressure at maximum hourly and annual average storage temperature.
- (3) Molecular weight.
- (4) Storage tanks, loading areas, and fugitive areas where the material is to be handled and the emission control device to be utilized.
- (5) Date new compound handling commenced.
- (6) Material Safety Data Sheet.
- (7) Maximum concentration of the chemical in mole percent (or in weight percent for fugitive areas) in the affected facilities.

Planned Maintenance, Startup, and Shutdown



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33. Planned maintenance, startup and shutdown activities (MSS) where the VOC partial pressure is less than 0.0002 psia at 104° F are exempt from the requirements in Special Conditions 34 through 43. (5/11)
34. This permit authorizes the emissions for the MSS activities summarized in the following table. (5/11)

Facilities	Description	Emissions Activity	EPN	Monitoring/Recordkeeping
instrumentation, filters, sight glass cleaning,	instrumentation, filters, sight glass cleaning	open to atmosphere	FUG-MSS	Level 1
pipng, valves, compressors, exchangers and equipment < 50 ft <sup>3</sup>	line breaks	open to atmosphere	FUG-MSS	Level 2
vessels > 50 ft <sup>3</sup>	line breaks where the vapor pressure of the material is less than 0.5 psia	open to atmosphere	FUG-MSS	Level 2
vessels > 50 ft <sup>3</sup>	line breaks	open to atmosphere	FUG-MSS	Level 3
all process units and tank farms	pan emissions	evaporative losses to atmosphere	FUG-MSS	Level 2
all process units and tank farms	wash pad emissions	evaporative losses to atmosphere	FUG-MSS	Level 2
all process units and tank farms	degreasing/lubricating/painting with aerosol cans	evaporative and particulate matter emissions to atmosphere	FUG-MSS	Level 1

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all process units and tank farms	priming pumps	evaporative losses to atmosphere	FUG-MSS	Level 1
all process units and tank farms	catalyst charging/handling	particulate emissions to atmosphere	FUG-MSS	Level 1
all process units	ammonia containing process vessels shutdown/depressurization/purge/degas	vent to flare	RA-22	Level 3

Level 1 identifies the inherently low emitting MSS activities that may be performed at the plant. Emissions from activities identified as Level 1 shall be considered to be equal to the potential to emit represented in the permit application. The estimated emissions from the activities listed as Level 1 must be revalidated annually. This revalidation shall consist of the estimated emissions for each type of activity and the basis for that emission estimate.

Routine maintenance activities, identified as Level 2 may be tracked through the work orders or equivalent. Emissions from activities identified in Level 2 shall be calculated using the number of work orders or equivalent that month and the emissions associated with that activity identified in the permit application.

The performance of each planned MSS activity identified as Level 3 and the emissions associated with it shall be recorded and include at least the following information:

- A. the process unit at which emissions from the MSS activity occurred, including the emission point number and name;
- B. the type of planned MSS activity;
- C. the date and time of the MSS activity and its duration;
- D. the estimated quantity of each air contaminant, or mixture of air

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contaminants, emitted with the data and methods used to determine it. The emissions shall be estimated using the methods identified in the permit application, consistent with good engineering practice.

All MSS emissions shall be summed monthly and the rolling 12-month emissions shall be updated on a monthly basis.

35. This permit authorizes emissions from the following temporary facilities used to support planned MSS activities at permanent site facilities: frac tanks, containers, temporary tanks, vessels, and vacuum trucks. Emissions from temporary facilities are authorized provided the temporary facility (a) does not remain on the plant site for more than 12 consecutive months, (b) is used solely to support planned MSS activities at the permanent site facilities authorized by this permit, and (c) does not operate as a replacement for an existing authorized facility. **(5/11)**
36. Process units and facilities, with the exception of those identified in Special Conditions 38, 39, 40, and Level 1 shall be depressurized, emptied, degassed, and placed in service in accordance with the following requirements. **(5/11)**
- A. The process equipment shall be depressurized to a control device or a controlled recovery system prior to venting to atmosphere, degassing, or draining liquid. Equipment that only contains material that is liquid with VOC partial pressure less than 0.50 psi at the normal process temperature and 95°F may be opened to atmosphere and drained in accordance with paragraph C of this special condition. The vapor pressure at 95°F may be used if the actual temperature of the liquid is verified to be less than 95°F and the temperature is recorded.
  - B. If mixed phase materials must be removed from process equipment, the cleared material shall be routed to a knockout drum or equivalent to allow for managed initial phase separation. If the VOC partial pressure is greater than 0.50 psi at either the normal process temperature or 95°F, any vents in the system must be routed to a control device or a controlled recovery system. The vapor pressure at 95°F may be used if the actual temperature of the liquid is verified to be less than 95°F and the temperature is recorded. Control must remain in place until degassing has been completed or the system is no longer vented to atmosphere.
  - C. All liquids from process equipment or storage vessels must be removed to the maximum extent practical prior to opening equipment to commence

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degassing and/or maintenance. Liquids must be drained into a closed vessel unless prevented by the physical configuration of the equipment. If it is necessary to drain liquid into an open pan or sump, the liquid must be covered or transferred to a covered vessel within one hour of being drained.

- D. If the VOC partial pressure is greater than 0.50 psi at the normal process temperature or 95°F, facilities shall be degassed using good engineering practice to ensure air contaminants are removed from the system through the control device or controlled recovery system to the extent allowed by process equipment or storage vessel design. The vapor pressure at 95°F may be used if the actual temperature of the liquid is verified to be less than 95°F and the temperature is recorded. The facilities to be degassed shall not be vented directly to atmosphere, except as necessary to establish isolation of the work area or to monitor VOC concentration following controlled depressurization or as allowed under Special Condition 36 E. The venting shall be minimized to the maximum extent practicable and actions taken recorded. The control device or recovery system utilized shall be recorded with the estimated emissions from controlled and uncontrolled degassing calculated using the methods that were used to determine allowable emissions for the permit application.
- (1) For MSS activities identified as Level 2, the following option may be used in lieu of (2) and (3) below. The facilities being prepared for maintenance shall not be vented directly to atmosphere until the VOC concentration has been verified to be less than 10 percent of the lower explosive limit (LEL) per the site safety procedures.
  - (2) The locations and/or identifiers where the purge gas or steam enters the process equipment or storage vessel and the exit points for the exhaust gases shall be recorded (process flow diagrams [PFDs] or piping and instrumentation diagrams [P&IDs] may be used to demonstrate compliance with the requirement).
  - (3) If the process equipment is purged with a gas, and not subsequently washed, two system volumes of purge gas must have passed through the control device or controlled recovery system before the vent stream may be sampled to verify acceptable VOC concentration prior to uncontrolled venting. The VOC sampling and analysis shall be performed using an instrument meeting the requirements of Special Condition 37. The sampling point shall be

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upstream of the inlet to the control device or controlled recovery system. The sample ports and the collection system must be designed and operated such that there is no air leakage into the sample probe or the collection system downstream of the process equipment or vessel being purged. The facilities shall be degassed to a control device or controlled recovery system until the VOC concentration is less than 10,000 ppmv or 10 percent of the LEL. Documented site procedures used to de-inventory equipment to a control device for safety purposes (i.e., hot work or vessel entry procedures) that achieve at least the same level of purging may be used in lieu of the above.

E. Gases and vapors with VOC partial pressure greater than 0.50 psi may be vented directly to atmosphere if all the following criteria are met:

- (1) It is not technically practicable to depressurize or degas, as applicable, into the process.
- (2) There is not an available connection to a plant control system (flare).
- (3) There is no more than 50 lb of air contaminant to be vented to atmosphere during shutdown or startup, as applicable.

All instances of venting directly to atmosphere per Special Condition 36.E must be documented when occurring as part of any MSS activity. The emissions associated with venting without control must be included in the work order or equivalent for those planned MSS activities identified as Level 2.

37. Air contaminant concentration shall be measured using an instrument/detector meeting one set of requirements specified below. **(5/11)**

A. VOC concentration shall be measured using an instrument meeting all the requirements specified in EPA Method 21 (40 CFR 60, Appendix A) with the following exceptions:

- (1) The instrument shall be calibrated within 24 hours of use with a calibration gas such that the response factor of the VOC (or mixture of VOCs) to be monitored shall be less than 2.0. The calibration gas and the gas to be measured, and its approximate response factor shall be recorded.

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- (2) Sampling shall be performed as directed by this permit in lieu of section 8.3 of Method 21. During sampling, data recording shall not begin until after two times the instrument response time. The date shall be recorded, and VOC concentration shall be monitored for at least 5 minutes, recording VOC concentration each minute. The highest measured VOC concentration shall not exceed the specified VOC concentration limit prior to uncontrolled venting.

B. Colorimetric gas detector tubes may be used to determine air contaminant concentrations if they are used in accordance with the following requirements.

- (1) The air contaminant concentration measured is less than 80 percent of the range of the tube. If the maximum range of the tube is greater than the release concentration defined in (3), the concentration measured is at least 20 percent of the maximum range of the tube.

- (2) The tube is used in accordance with the manufacturer's guidelines.

- (3) At least 2 samples taken at least 5 minutes apart must satisfy the following prior to uncontrolled venting:

measured contaminant concentration (ppmv) < release concentration.

Where the release concentration is:

10,000\* mole fraction of the total air contaminants present that can be detected by the tube.

The mole fraction may be estimated based on process knowledge. The release concentration and basis for its determination shall be recorded.

Records shall be maintained of the tube type, range, measured concentrations, and date the samples were taken.

C. Lower explosive limit measured with a lower explosive limit detector.

- (1) The detector shall be calibrated monthly with a certified pentane gas standard at 25% of the lower explosive limit (LEL) for pentane.

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Records of the calibration date and calibration result (pass/fail) shall be maintained.

(2) Each day a detector is used, a functionality test shall be performed using the same certified gas standard used for calibration. The LEL monitor shall read no lower than 90% of the calibration gas certified value. Records, including the date and test results, shall be maintained.

(3) A certified methane gas standard equivalent to 25% of the LEL for pentane may be used for calibration and functionality tests provided that the LEL response is within 95% of that for pentane.

D. Lower explosive limit measured with a MSA Altair lower explosive limit detector.

(1) The detector shall be calibrated monthly with a certified pentane gas standard at 58% of the lower explosive limit (LEL) for pentane. Records of the calibration date and calibration result (pass/fail) shall be maintained.

(2) Each day a detector is used, a functionality test shall be performed using the same certified gas standard used for calibration. The LEL monitor shall read no lower than 90% of the calibration gas certified value. Records, including the date and test results, shall be maintained.

(3) A certified methane gas standard equivalent to 58% of the LEL for pentane may be used for calibration and functionality tests provided that the LEL response is within 95% of that for pentane.

38. The following requirements apply to fixed roof storage tanks. **(5/11)**

A. The tank shall not be opened or ventilated without control, except when air circulation in the vapor space is minimized as allowed below, until one of the criteria in part B of this condition is satisfied.

(1) One manway may be opened to allow access to the tank to remove or de-volatilize the remaining liquid. Other manways or access points may be opened as necessary to remove or de-volatilize the remaining liquid. Wind barriers shall be installed at all open

manways and access points to minimize air flow through the tank.

(2) Access points shall be closed when not in use.

B. The tank may be opened without restriction and ventilated without control, after all standing liquid has been removed from the tank or the liquid remaining in the tank has a VOC partial pressure less than 0.02 psia. These criteria shall be demonstrated in any one of the following ways.

(1) Low VOC partial pressure liquid that is soluble with the liquid previously stored may be added to the tank to lower the VOC partial pressure of the liquid mixture remaining in the tank to less than 0.02 psia. This liquid shall be added during tank degassing if practicable. The estimated volume of liquid remaining in the drained tank and the volume and type of liquid added shall be recorded. The liquid VOC partial pressure may be estimated based on this information and engineering calculations.

(2) If water is added or sprayed into the tank to remove standing VOC, one of the following must be demonstrated:

- (a) Take a representative sample of the liquid remaining in the tank and verify no visible sheen using the static sheen test from 40 CFR 435 Subpart A Appendix 1.
- (b) Take a representative sample of the liquid remaining in the tank and verify hexane soluble VOC concentration is less than 1000 ppmw using EPA method 1664 (may also use 8260B or 5030 with 8015 from SW-846).
- (c) Stop ventilation and close the tank for at least 24 hours. When the tank manway is opened after this period, verify VOC concentration is less than 1000 ppmv or 1% of the LEL through the procedure in Special Condition 37.
- (d) Demonstrate that the calculated VOC partial pressure of the water/VOC mixture is less than 0.02 psia using available information and engineering calculations.
- (e) Take a representative sample of the liquid remaining in the tank and verify that the TOC concentration is less than 1000



ppmw using EPA method 415.1.

- (3) No standing liquid verified through visual inspection.
  - (4) The permit holder shall maintain records to document the method used to release the tank.
  - (5) If it is documented that the material previously contained in the tank has a vapor pressure of less than 0.02 psia, no further demonstration is necessary.
- C. If the ventilation of the vapor space is controlled, the emission control system shall meet the requirements of (1) through (5). Controlled degassing of the vapor space shall be completed as follows:
- (1) Any gas or vapor removed from the vapor space must be routed to a control device or a controlled recovery system and controlled degassing must be maintained until the VOC concentration is less than 10,000 ppmv or 10 percent of the LEL. The locations and identifiers of vents other than permanent roof fittings and seals, control device or controlled recovery system, and controlled exhaust stream shall be recorded. There shall be no other gas/vapor flow out of the vapor space when degassing to the control device or controlled recovery system.
  - (2) The vapor space shall be vented using good engineering practice to ensure air contaminants are flushed out of the tank through the control device or controlled recovery system to the extent allowed by the storage tank design.
  - (3) A volume of purge gas equivalent to twice the volume of the vapor space must have passed through the control device or into a controlled recovery system, before the vent stream may be sampled to verify acceptable VOC concentration. The measurement of purge gas volume shall not include any make-up air introduced into the control device or recovery system. The VOC sampling and analysis shall be performed as specified in Special Condition 37.
  - (4) The sampling point shall be upstream of the inlet to the control device or controlled recovery system. The sample ports and the collection system must be designed and operated such that there is no air

leakage into the sample probe or the collection system downstream of the process equipment or vessel being purged.

- (5) Degassing must be performed every 24 hours unless there is no standing liquid in the tank or the VOC partial pressure of the remaining liquid in the tank is less than 0.15 psia.

D. Records shall be maintained as follows.

- (1) for the purpose of estimating emissions, the date, and other information specified for each of the following events:
- (a) start and completion of controlled degassing, and total volumetric flow,
  - (b) all standing liquid was removed from the tank or any transfers of low VOC partial pressure liquid to or from the tank including volumes and vapor pressures to reduce tank liquid VOC partial pressure to  $<0.02$  psi,
  - (c) if there is liquid in the tank, VOC partial pressure of liquid, start and completion of uncontrolled degassing, and total volumetric flow;
- (2) the estimated quantity of each air contaminant, or mixture of air contaminants, emitted between events a with the data and methods used to determine it.

39. The following requirements apply to vacuum and air mover truck operations to support planned MSS at this site: **(5/11)**

- A. Vacuum pumps and blowers shall not be operated on trucks containing or vacuuming liquids with VOC partial pressure greater than 0.50 psi at 95°F unless the vacuum/blower exhaust is routed to a control device or a controlled recovery system.
- B. Equip fill line intake with a "duckbill" or equivalent attachment if the hose end cannot be submerged in the liquid being collected.
- C. A daily record containing the information identified below is required for each vacuum truck in operation at the site each day.

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- (1) Prior to initial use, identify any liquid in the truck. Record the liquid level and document that the VOC partial pressure is less than 0.50 psi if the vacuum exhaust is not routed to a control device or a controlled recovery system. After each liquid transfer, identify the liquid transferred and document that the VOC partial pressure is less than 0.50 psi if the vacuum exhaust is not routed to a control device or a controlled recovery system.
  - (2) For each liquid transfer made with the vacuum operating, record the duration of any periods when air may have been entrained with the liquid transfer. The reason for operating in this manner and whether a "duckbill" or equivalent was used shall be recorded. Short, incidental periods, such as those necessary to walk from the truck to the fill line intake, do not need to be documented.
  - (3) If the vacuum truck exhaust is controlled with a control device other than an engine or oxidizer, VOC exhaust concentration upon commencing each transfer, at the end of each transfer, and at least every hour during each transfer shall be recorded, measured using an instrument meeting the requirements of Special Condition 37 A or B.
  - (4) The volume in the vacuum truck at the end of the day, or the volume unloaded, as applicable.
- D. The permit holder shall determine the vacuum truck emissions each month using the daily vacuum truck records and the calculation methods utilized in the permit application. If records of the volume of liquid transferred for each pick-up are not maintained, the emissions shall be determined using the physical properties of the liquid vacuumed with the greatest potential emissions. Rolling 12 month vacuum truck emissions shall also be determined on a monthly basis.
- E. If the VOC partial pressure of all the liquids vacuumed into the truck is less than 0.10 psi, this shall be recorded when the truck is unloaded or leaves the plant site and the emissions may be estimated as the maximum potential to emit for a truck in that service as documented in the permit application. The recordkeeping requirements in Special Condition 39 A through D do not apply.

40. The following requirements apply to containers, frac tanks, or other temporary tanks

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and vessels used in support of MSS activities. **(5/11)**

- A. The exterior surfaces of these tanks/vessels that are exposed to the sun shall be white or aluminum effective May 1, 2013. This requirement does not apply to tanks/vessels that only vent to atmosphere when being filled.
  - B. These tanks/vessels must be covered and equipped with fill pipes that discharge within 6 inches of the tank/vessel bottom.
  - C. These requirements do not apply to vessels storing less than 275 gallons of liquid that are closed such that the vessel does not vent to atmosphere. The vessel may be vented to the atmosphere only when adding or removing material.
  - D. The permit holder shall maintain an emissions record which includes calculated emissions of VOC from all frac tanks during the previous calendar month and the past consecutive 12 month period. The record shall include tank identification number, dates put into and removed from service, control method used, tank capacity and volume of liquid stored in gallons, name of the material stored, VOC molecular weight, and VOC partial pressure at the estimated monthly average material temperature in psia. Filling emissions for tanks shall be calculated using the TCEQ publication titled "Technical Guidance Package for Chemical Sources - Loading Operations" and standing emissions determined using: the TCEQ publication titled "Technical Guidance Package for Chemical Sources - Storage Tanks."
  - E. If the tank/vessel is used to store liquid with VOC partial pressure less than 0.10 psi at 95°F, records may be limited to the days the tank is in service and the liquid stored. Emissions may be estimated based upon the potential to emit as identified in the permit application.
41. MSS activities represented in the permit application may be authorized under permit by rule only if the procedures, emission controls, monitoring, and recordkeeping are the same as those required by this permit. **(5/11)**
42. The plant flare system shall satisfy the requirements of Special Condition 23 when controlling emissions generated by MSS activities. **(5/11)**
43. With the exception of the MAERT emission limits, Special Conditions 33 through 42 and Special Condition 2E become effective 180 days after this permit has been

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issued. During this period, monitoring and recordkeeping shall satisfy the requirements in Special Condition 34 for Level 3 MSS Activities. Emissions shall be estimated using good engineering practice and methods to provide reasonably accurate representations for emissions. The basis used for determining the quantity of air contaminants to be emitted shall be recorded. The permit holder may maintain abbreviated records of emissions from Level 1 and Level 2 Activities as allowed in Special Condition 34 rather than documenting all the information required by Special Condition for Level 3 Activities. **(5/11)**

Date: May 13, 2015

# EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

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This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
RA22	Flare	VOC	23.05	5.7
		Ethylene Oxide	0.03	0.03
		Propylene Oxide	0.03	0.03
		NO <sub>x</sub>	93.71	39.28
		CO	44.49	33.96
		NH <sub>3</sub>	5.48	23.39
		NH <sub>3</sub> (5)	20.00	-
RE22	RE22 Fume Incinerator	VOC	2.05	0.28
		NO <sub>x</sub>	31.31	6.74
		CO	0.84	2.21
		SO <sub>2</sub>	0.01	0.02
		PM	0.08	0.20
RF60	Flare	VOC	2.51	10.12
		Ethylene Oxide	1.32	5.39
		Propylene Oxide	1.32	5.39
		NO <sub>x</sub>	2.08	3.71
		CO	17.86	31.81
		HBr	6.15	1.07
HA1	Hot Oil Process Heater	VOC	0.05	0.18
		NO <sub>x</sub>	0.76	3.3
		CO	0.64	2.8
		SO <sub>2</sub>	0.01	0.02
		PM	0.06	0.25
LOAD	Loading	VOC	4.15	1.02
PAINT1	Painting	VOC	24.54	4.91
		PM	36.76	3.45
UC678	Cooling Tower	VOC	0.51	2.21

## EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
UF349	Cooling Tower	VOC	0.68	2.95
FE29	Scrubber	VOC	0.01	0.01
FE30	WE3 Unloading Tankcar Scrubber	VOC	0.07	0.03
		NH <sub>3</sub>	0.1	<0.01
FE41	Scrubber	VOC	0.63	0.07
FE42	Scrubber	VOC	2.59	0.64
FE45	Scrubber	VOC	0.64	0.09
TG52	Scrubber	VOC	0.27	0.02
FC4	Process Vent	VOC	0.03	0.01
		PM	0.01	0.02
LG5	Process Vent	VOC	1.06	1.91
		NH <sub>3</sub>	0.78	2.5
LB8	Process Vent	VOC	0.01	0.01
FE53	Atmospheric Tank	VOC	2.78	0.13
FE55	Atmospheric Tank	VOC	0.61	0.02
TB1	Atmospheric Tank	VOC	0.26	0.02
TB14	Atmospheric Tank	VOC	3.18	0.38
TB15	Atmospheric Tank	VOC	3.18	0.38
TB16	Atmospheric Tank	VOC	0.01	0.01
TB17	Atmospheric Tank	VOC	0.01	0.01

## EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
TB18	Atmospheric Tank	VOC	0.01	0.01
TB19	Atmospheric Tank	VOC	0.04	0.01
TB20	Atmospheric Tank	VOC	0.04	0.01
TB21	Atmospheric Tank	VOC	0.01	0.01
TB22	Atmospheric Tank	VOC	0.01	0.01
TB24	Atmospheric Tank	VOC	0.13	0.01
TB7	Atmospheric Tank	VOC	0.36	0.02
TC5	Atmospheric Tank	VOC	0.02	0.01
TE106	Atmospheric Tank	VOC	3.05	0.38
TE11	Atmospheric Tank	VOC	0.09	0.02
TE110	Atmospheric Tank	VOC	0.26	0.14
TE111	Atmospheric Tank	VOC	0.26	0.13
TE112	Atmospheric Tank	VOC	3.61	0.16
TE114	Atmospheric Tank	VOC	0.26	0.08
TE118	Atmospheric Tank	VOC	0.26	0.04
TE119	Atmospheric Tank	VOC	5.20	0.38
TE12	Atmospheric Tank	VOC	0.09	0.02
TE121	Atmospheric Tank	VOC	5.2	0.38
TE122	Atmospheric Tank	VOC	5.2	0.38



## EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
TE123	Atmospheric Tank	VOC	5.2	0.38
TE125	Atmospheric Tank	VOC	3.05	0.36
TE15	Atmospheric Tank	VOC	0.66	0.27
TE16	Atmospheric Tank	VOC	0.01	0.01
TE17	Atmospheric Tank	VOC	0.3	0.04
TE21	Atmospheric Tank	VOC	0.29	0.03
TE25	Atmospheric Tank	VOC	0.04	0.01
TE26	Atmospheric Tank	VOC	0.04	0.01
TE29	Atmospheric Tank	VOC	0.09	0.01
TE30	Atmospheric Tank	VOC	0.02	0.01
TE46	Atmospheric Tank	VOC	0.01	0.01
TE50	Atmospheric Tank	VOC	0.29	0.03
TE51	Atmospheric Tank	VOC	3.05	0.38
TE52	Atmospheric Tank	VOC	3.05	0.38
TE53	Atmospheric Tank	VOC	0.26	0.07
TE54	Atmospheric Tank	VOC	3.05	0.38
TE55	Atmospheric Tank	VOC	0.26	0.04
TE60	Atmospheric Tank	VOC	0.27	0.05

EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
TE62	Atmospheric Tank	VOC	0.26	0.07
TE70	Atmospheric Tank	VOC	0.26	0.03
TE71	Atmospheric Tank	VOC	0.26	0.03
TE72	Atmospheric Tank	VOC	0.3	0.04
TE73	Atmospheric Tank	VOC	0.26	0.02
TE76	Atmospheric Tank	VOC	3.05	0.48
TE79	Atmospheric Tank	VOC	0.26	0.02
TG24	Atmospheric Tank	VOC	0.29	0.03
TG25	Atmospheric Tank	VOC	0.29	0.03
TG28	Atmospheric Tank	VOC	0.26	0.02
TG45	Atmospheric Tank	VOC	0.26	0.04
TG47	Atmospheric Tank	VOC	0.26	0.06
TG48	Atmospheric Tank	VOC	0.26	0.08
TG49	Atmospheric Tank	VOC	0.26	0.08
TG50	Atmospheric Tank	VOC	0.26	0.03
TG51	Atmospheric Tank	VOC	0.26	0.03
TG53	Atmospheric Tank	VOC	0.26	0.09
TG56	Atmospheric Tank	VOC	0.26	0.1
TG59	Atmospheric Tank	VOC	0.26	0.1

## EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
TF5	IFR Tank	VOC	0.26	0.09
		NH <sub>3</sub>	0.01	0.01
Product Tanks	All Product/RunDown Tanks Listed Below	VOC		3.55
FC56	Product Tank	VOC	0.17	
FD5	RunDown Tank	VOC	1.05	
FD6	RunDown Tank	VOC	1.05	
FD7	RunDown Tank	VOC	1.51	
FD8	RunDown Tank	VOC	1.51	
FE9	Product Tank	VOC	0.17	
FE21	Product Tank	VOC	0.17	
TC42	Product Tank	VOC	0.11	
TD2	RunDown Tank	VOC	1.28	
TD3	RunDown Tank	VOC	1.28	
TD6	RunDown Tank	VOC	1.28	
TD8	RunDown Tank	VOC	1.58	
TD9	RunDown Tank	VOC	1.58	
TD12	RunDown Tank	VOC	1.58	

## EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
TD13	RunDown Tank	VOC	1.58	
TD14	RunDown Tank	VOC	1.58	
TD15	RunDown Tank	VOC	1.58	
TD22	RunDown Tank	VOC	0.93	
TE2	Product Tank	VOC	0.17	
TE5	Product Tank	VOC	0.17	
TE6	Product Tank	VOC	0.17	
TE7	Product Tank	VOC	0.17	
TE8	Product Tank	VOC	0.11	
TE9	Product Tank	VOC	0.11	
TE10	Product Tank	VOC	0.11	
TE13	Product Tank	VOC	0.17	
TE14	Product Tank	VOC	0.17	
TE18	Product Tank	VOC	0.17	
TE19	Product Tank	VOC	0.17	
TE20	Product Tank	VOC	0.17	
TE22	Product Tank	VOC	0.17	
TE28	Product Tank	VOC	0.17	
TE31	Product Tank	VOC	0.17	

## EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
TE32	Product Tank	VOC	0.17	
TE36	Product Tank	VOC	0.17	
TE37	Product Tank	VOC	0.17	
TE39	Product Tank	VOC	0.11	
TE44	Product Tank	VOC	0.11	
TE47	Product Tank	VOC	0.17	
TE48	Product Tank	VOC	0.17	
TE49	Product Tank	VOC	0.71	
TE56	Product Tank	VOC	0.17	
TE57	Product Tank	VOC	0.17	
TE58	Product Tank	VOC	0.17	
TE61	Product Tank	VOC	0.11	
TE64	Product Tank	VOC	0.61	
TE65	Product Tank	VOC	0.61	
TE67	Product Tank	VOC	0.17	
TE77	Product Tank	VOC	0.11	
TE78	Product Tank	VOC	0.11	
TE80	Product Tank	VOC	0.11	
TE83	Product Tank	VOC	0.11	

## EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
TE84	Product Tank	VOC	0.11	
TE105	Product Tank	VOC	0.11	
TE117	Product Tank	VOC	0.17	
TE131	Product Tank	VOC	0.17	
TE132	Product Tank	VOC	0.17	
TE133	Product Tank	VOC	0.17	
TE134	Product Tank	VOC	0.11	
TG1	RunDown Tank	VOC	1.42	
TG2	RunDown Tank	VOC	1.42	
TG29	RunDown Tank	VOC	1.42	
TG30	RunDown Tank	VOC	1.42	
TG32	RunDown Tank	VOC	1.02	
TG33	RunDown Tank	VOC	1.02	
TG57	Product Tank	VOC	0.17	
TG58	Product Tank	VOC	0.17	
TG60	RunDown Tank	VOC	0.17	
RAW MATERIAL TANKS	All RM Tanks	VOC		0.17
FC55	D-Kettle RM Tank	VOC	1.46	

## EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
TE3	D-Kettle RM Tank	VOC	1.42	
TE4	D-Kettle RM Tank	VOC	1.46	
TD7	G-Kettle RM Tank	VOC	4.67	
TE23	G-Kettle RM Tank	VOC	4.81	
TE33	G-Kettle RM Tank	VOC	6.28	
TE34	G-Kettle RM Tank	VOC	8.59	
TE35	G-Kettle RM Tank	VOC	0.28	
TE38	G-Kettle RM Tank	VOC	6.46	
TE45	G-Kettle RM Tank	VOC	6.45	
TE59	G-Kettle RM Tank	VOC	8.95	
TE63	G-Kettle RM Tank	VOC	11.74	
TE81	G-Kettle RM Tank	VOC	7.47	
TE82	G-Kettle RM Tank	VOC	8.51	
TE85	G-Kettle RM Tank	VOC	1.65	
TG3	G-Kettle RM Tank	VOC	6.59	
TG31	G-Kettle RM Tank	VOC	10.01	
TG36	G-Kettle RM Tank	VOC	9.66	
TG37	G-Kettle RM Tank	VOC	11.22	
TG44	G-Kettle RM Tank	VOC	8.38	

## EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
FD3	Blend Tank	VOC	0.02	0.01
FD4	Blend Tank	VOC	0.02	0.01
TD21	Slurry Tank	VOC	0.03	0.01
TE113	AGM-500 Tank	VOC	1.01	0.39
TG43	IPA Tank	VOC	5.72	0.07
FG55	G-Kettle Reactor	VOC	0.01	0.01
NEUTRALIZERS	All Neutralizers	VOC		4.04
FG2	G-Kettle Neutralizer	VOC	1.11	
FG52	G-Kettle Neutralizer	VOC	1.11	
FD9	D-Kettle Neutralizer	VOC	1.11	
FD10	D-Kettle Neutralizer	VOC	1.11	
FD21	D-Kettle Neutralizer	VOC	1.11	
FD24	D-Kettle Neutralizer	VOC	1.11	
AAUFUG	Fugitive Area (4)	VOC	0.61	2.66
		Ethylene Oxide	0.04	0.17
		NH <sub>3</sub>	0.04	0.14
BCAREAF	Fugitive Area (4)	VOC	2.03	8.88
		Ethylene Oxide	0.01	0.01
		Propylene Oxide	0.01	0.01
CARBFUG	Fugitive Area (4)	VOC	0.66	2.87
		Ethylene Oxide	0.02	0.07



## EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
		Propylene Oxide	0.02	0.05
CARB2FUG	Fugitive Area (4)	VOC	0.07	0.31
DKETTFUG	Fugitive Area (4)	VOC	2.25	9.86
		Ethylene Oxide	0.29	1.25
		Propylene Oxide	0.03	0.1
		PM	0.01	0.01
DRUMFUG	Fugitive Area (4)	VOC	0.08	0.35
RA22FUG	Fugitive Area (4)	VOC	0.02	0.08
		Ethylene Oxide	0.01	0.01
		NH <sub>3</sub>	0.18	0.78
RF60FUG	Fugitive Area (4)	VOC	0.02	0.09
		Ethylene Oxide	0.01	0.01
		Propylene Oxide	0.01	0.01
GKETTFUG	Fugitive Area (4)	VOC	0.39	1.69
		Ethylene Oxide	0.03	0.12
		Propylene Oxide	0.02	0.07
		PM	0.01	0.01
INCINFUG	Fugitive Area (4)	VOC	0.19	0.83
		Ethylene Oxide	0.01	0.01
		NH <sub>3</sub>	0.02	0.08
JAU1F	Fugitive Area (4)	VOC	0.03	0.08
		Ethylene Oxide	0.02	0.02
		NH <sub>3</sub>	0.08	0.30
JAU1IF	Fugitive Area (4)	VOC	0.10	0.44
		Ethylene Oxide	0.01	0.01
		NH <sub>3</sub>	0.08	0.35

## EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

## AIR CONTAMINANTS DATA

<u>Emission Point No. (1)</u>	<u>Source Name (2)</u>	<u>Air Contaminant Name (3)</u>	<u>Emission Rates *</u>	
			<u>lb/hr</u>	<u>TPY**</u>
JAUIIF	Fugitive Area (4)	VOC	0.01	0.01
		Ethylene Oxide	0.01	0.01
		NH <sub>3</sub>	0.07	0.28
RAILFUG	Fugitive Area (4)	VOC	0.08	0.34
		NH <sub>3</sub>	0.01	0.01
SAUFUG	Fugitive Area (4)	VOC	0.10	4.12
		Ethylene Oxide	0.01	0.01
		NH <sub>3</sub>	0.02	0.06
TFARMFUG	Fugitive Area (4)	VOC	1.55	6.79
		Ethylene Oxide	0.08	0.33
		Propylene Oxide	0.15	0.64
		NH <sub>3</sub>	0.05	0.21
TC17FUG	Fugitive Area (4)	VOC	0.18	0.76
		Ethylene Oxide	0.01	0.01
		NH <sub>3</sub>	0.01	0.01
TRUCKFUG	Fugitive Area (4)	VOC	0.16	0.7
		Propylene Oxide	0.01	0.03
UNLOADFG	Fugitive Area (4)	VOC	0.43	1.88
		Ethylene Oxide	0.11	0.47
		NH <sub>3</sub>	0.05	0.21
FUGWW	Wastewater Fugitive (4)	VOC	0.39	1.71
		Ethylene Oxide	0.17	0.73
FUG-MSS		VOC	67.86	4.91
		NH <sub>3</sub>	4.61	0.63
		PM	0.03	0.01
		PM <sub>10</sub>	0.02	0.01
		PM <sub>2.5</sub>	0.02	0.01

EMISSION SOURCE - MAXIMUM ALLOWABLE EMISSION RATES

- (1) Emission point identification - either specific equipment designation or emission point number from plot plan.
- (2) Specific point source name. For fugitive sources use area name or fugitive source name.
- (3) VOC - volatile organic compounds as defined in Title 30 Texas Administrative Code ' 101.1  
NO<sub>x</sub> - total oxides of nitrogen  
CO - carbon monoxide  
NH<sub>3</sub> - anhydrous ammonia  
SO<sub>2</sub> - sulfur dioxide  
PM - particulate matter, suspended in the atmosphere, including PM<sub>10</sub>  
PM<sub>10</sub> - particulate matter equal to or less than 10 microns in diameter. Where PM is not listed, it shall be assumed that no PM greater than 10 microns is emitted.  
HBr - hydrogen bromide
- (4) Emission rate is an estimate and compliance is demonstrated by meeting the requirements of the applicable special conditions and permit application representations.
- (5) This emission rate applies only while MSS emissions are routed to the flare.

\* Emission rates are based on and the facilities are limited by the following maximum operating schedule:

\_\_\_\_\_ Hrs/days \_\_\_\_\_ Days/weeks \_\_\_\_\_ Weeks/year or 8,760 Hrs/year

\*\* Compliance with annual emission limits is based on a rolling 12-month period.

Dated: May 9, 2011

**Texas Commission on Environmental Quality  
Certification and Registration for Permits by Rule  
Form PI-7-CERT  
(Page 1)**

NOV 02 2015  
**APIRT**

<b>I. Registrant Information</b>		
A. Company or Other Legal Customer Name: Huntsman Petrochemical LLC		
B. Company Official Contact Information ( <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Mrs. <input type="checkbox"/> Ms. <input type="checkbox"/> Other _____)		
Name: Walter Stamm		
Title: Plant Manager		
Mailing Address: 5451 Jefferson Chemical Road		
City: Conroe	State: Texas	ZIP Code: 77301
Phone: (936) 760-6226	Fax: (936) 760-6280	
E-mail Address: walter_stamm@huntsman.com		
<i>All PBR registration responses will be sent via e-mail unless a hard copy is specifically requested. The company official must initial here if hard copy is requested. _____ (please initial)</i>		
C. Technical Contact Information ( <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Mrs. <input type="checkbox"/> Ms. <input type="checkbox"/> Other _____)		
Name: Mark Strohbeck		
Title: Staff Environmental Specialist		
Company Name: Huntsman Petrochemical LLC		
Mailing Address: 5451 Jefferson Chemical Road		
City: Conroe	State: Texas	ZIP Code: 77301
Phone: (936) 760-6224	Fax: (936) 760-6280	
E-mail: mark_w_strohbeck@huntsman.com		
<b>II. Facility and Site Information</b>		
A. Name and Type of Facility		
Facility Name: New SAU Reactors Project		
Type of Facility:	<input checked="" type="checkbox"/> Permanent	<input type="checkbox"/> Temporary
For portable units, please provide the serial number of the equipment being authorized below.		
Serial No:	Serial No:	
B. Facility Location Information		
Street Address: 5451 Jefferson Chemical Road		
If there is no street address, provide written driving directions to the site and provide the closest city or town, county, and ZIP code for the site (attach description if additional space is needed).		
City: Conroe	County: Montgomery	ZIP Code: 77301

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Page 2**

<b>II. Facility and Site Information (continued)</b>	
C. TCEQ Core Data Form	
Is the Core Data Form (TCEQ Form Number 10400) attached?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If "NO," provide customer reference number (CN) and regulated entity number (RN) below.	
Customer Reference Number (CN): CN603603093	
Regulated Entity Number (RN): RN100219740	
D. TCEQ Account Identification Number (if known): MQ-0012-Q	
E. PBR number(s) claimed under 30 TAC Chapter 106	
(List all the individual rule number(s) that are being claimed.)	
106. 261 Facilities (Emission Limitations)	106.
106. 262 Facilities (Emission and Distance Limitations)	106.
106.	106.
F. Historical Standard Exemption or PBR	
Are you claiming a historical standard exemption or PBR?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If "YES," enter rule number(s) and associated effective date in the spaces provided below.	
Rule Number(s)	Effective Date
G. Previous Standard Exemption or PBR Registration Number	
Is this authorization for a change to an existing facility previously authorized under a standard exemption or PBR?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If "YES," enter previous standard exemption number(s) and PBR registration number(s), and associated effective dates in the spaces provided below.	
Standard Exemption and PBR Registration Number(s)	Effective Date
See Title V	
H. Other Facilities at this Site Authorized by Standard Exemption, PBR, or Standard Permit	
Are there any other facilities at this site that are authorized by an Air Standard Exemption, PBR, or Standard Permit?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If "YES," enter standard exemption number(s), PBR registration number(s), and Standard Permit registration number(s), and associated effective date in the spaces provided below.	
Standard Exemption, PBR Registration, and Standard Permit Registration Number(s)	Effective Date
See Title V	

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Page 3**

<b>II. Facility and Site Information</b> <i>(continued)</i>	
<b>I. Other Air Preconstruction Permits</b>	
Are there any other air preconstruction permits at this site?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If "YES," enter permit number(s) in the spaces provided below.	
4788	42682
20123	
<b>J. Affected Air Preconstruction Permits</b>	
Does the PBR being claimed directly affect any permitted facility?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If "YES," enter the permit number(s) in the spaces provided below.	
4788	
<b>K. Federal Operating Permit (FOP) Requirements (30 TAC Chapter 122 Applicability)</b>	
1. Is this facility located at a site that is required to obtain an FOP pursuant to 30 TAC Chapter 122?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> To Be Determined
If the site currently has an existing FOP, enter the permit number: O-1384	
Check the requirements of 30 TAC Chapter 122 that will be triggered if this certification is accepted. <i>(check all that apply)</i>	
<input type="checkbox"/> Initial Application for an FOP <input type="checkbox"/> Significant Revision for an SOP <input type="checkbox"/> Minor Revision for an SOP <input checked="" type="checkbox"/> Operational Flexibility/Off Permit Notification for an SOP <input type="checkbox"/> Revision for a GOP <input type="checkbox"/> To be Determined <input type="checkbox"/> None	
2. Identify the type(s) of FOP issued and/or FOP application(s) submitted/pending for the site. <i>(check all that apply)</i>	
<input checked="" type="checkbox"/> SOP <input type="checkbox"/> GOP <input type="checkbox"/> GOP application/revision (submitted or under APD review) <input type="checkbox"/> N/A <input type="checkbox"/> SOP application/revision (submitted or under APD review)	
<b>III. Fee Information</b> <i>(See Section VII. for address to send fee or go to <a href="http://www.tceq.texas.gov/epay">www.tceq.texas.gov/epay</a> to pay online.)</i>	
<b>A. Fee Requirements</b>	
Is a fee required per Title 30 TAC § 106.50?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If "NO," specify the exception <i>(check all that apply)</i>	
1. Registration is solely to establish a federally enforceable emission limit.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
2. Registration is within six months of an initial PBR review, and it is addressing deficiencies, administrative changes, or other allowed changes.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
3. Registration is for a remediation project (30 TAC § 106.533).	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO

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<b>III. Fee Information</b> (See Section VII. for address to send fee or go to <a href="http://www.tceq.texas.gov/epay">www.tceq.texas.gov/epay</a> to pay online.) (continued)	
<b>B. Fee Amount</b>	
1. A \$100 fee is required if <i>any</i> of the answers in III.B.1 are "YES."	
This business has less than 100 employees.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
This business has less than 6 million dollars in annual gross receipts.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
This registration is submitted by a governmental entity with a population of less than 10,000.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
This registration is submitted by a non-profit organization.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
2. A \$450 fee is required for all other registrations.	
<b>C. Payment Information</b>	
Check/money order/transaction or voucher number:	256115
Individual or company name on check: Huntsman Petrochemical LLC	
Fee Amount: \$ 450	
Was fee paid online?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>IV. Technical Information Including State And Federal Regulatory Requirements</b>	
<b>Place a check next to the appropriate box to indicate what is included in your submittal.</b>	
<b>NOTE:</b> Any technical or essential information needed to confirm that facilities are meeting the requirements of the PBR must be provided. Not providing key information could result in an automatic deficiency and voiding of the project.	
<b>A. PBR requirements</b> (Checklists are optional; however, your review will go faster if you provide applicable checklists.)	
Did you demonstrate that the general requirements in 30 TAC § 106.4 are met?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Did you demonstrate that the individual requirements of the specific PBR are met?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>B. Confidential Information</b> (All pages properly marked "CONFIDENTIAL")	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<b>C. Process Flow Diagram</b>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>D. Process Description</b>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>E. Maximum Emissions Data and Calculations</b>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>Note:</b> If the facilities listed in this registration are subject to the Mass Emissions Cap & Trade program under <b>30 TAC Chapter 101, Subchapter H, Division 3</b> , the owner/operator of these facilities must possess NO <sub>x</sub> allowances equivalent to the actual NO <sub>x</sub> emissions from these facilities.	

**Texas Commission on Environmental Quality  
Certification and Registration for Permits by Rule  
Form PI-7-CERT  
Page 5**

**IV. Technical Information Including State And Federal Regulatory Requirements**

*(continued)*

**Place a check next to the appropriate box to indicate what is included in your submittal.**

**Note:** Any technical or essential information needed to confirm that facilities are meeting the requirements of the PBR must be provided. Not providing key information could result in an automatic deficiency and voiding of the project.

F. Is this certification being submitted to certify the emissions for the entire site? ☐ YES ☒ NO

If "NO," include a summary of the specific facilities and emissions being certified.

G. Table 1(a) (Form 10153) Emission Point Summary ☒ YES ☐ NO

H. Distances from Property Line and Nearest Off-Property Structure

Distance from this facility's emission release point to the nearest property line: >600 feet

Distance from this facility's emission release point to the nearest off-property structure: >900 feet

I. Project Status

Has the company implemented the project or waiting on a response from TCEQ? ☒ Implemented ☐ Waiting

J. Projected Start of Construction and Projected Start of Operation Dates

Projected Start of Construction (provide date): 09/25/2015

Projected Start of Operation (provide date): 10/24/2015

**V. Delinquent Fees**

This form **will not be processed** until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ is paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: [www.tceq.texas.gov/agency/delin/index.html](http://www.tceq.texas.gov/agency/delin/index.html).

**VI. Signature For Registration And Certification**

The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which this application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7; the Texas Health and Safety Code, Chapter 382, the Texas Clean Air Act (TCAA); the air quality rules of the Texas Commission on Environmental Quality; or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.

Name (printed): Walter Stamm

Signature (original signature required): 

Date: 10/29/15



## TCEQ ePay Voucher Receipt

### Transaction Information

<b>Voucher Number:</b>	256115
<b>Trace Number:</b>	582EA000202020
<b>Date:</b>	10/29/2015 02:18 PM
<b>Payment Method:</b>	CC - Authorization 0000041574
<b>Amount:</b>	\$450.00
<b>Fee Type:</b>	PERMIT BY RULE - NOT SMALL BUSINESS, CITY OR ISD
<b>ePay Actor:</b>	Mark Strohbeck

### Payment Contact Information

<b>Name:</b>	Mark Strohbeck
<b>Company:</b>	Huntsman Petrochemical Llc
<b>Address:</b>	5451 Jefferson Chemical Rd, Conroe, TX 77301
<b>Phone:</b>	936-760-6224

### Site Information

<b>Site Name:</b>	HUNTSMAN PETROCHEMICAL CONROE PLANT
<b>Site Address:</b>	5451 JEFFERSON CHEMICAL RD, CONROE, TX 77301
<b>Site Location:</b>	CONROE TX MONTGOMERY COUNTY

### Customer Information

<b>Customer Name:</b>	HUNTSMAN PETROCHEMICAL LLC
-----------------------	----------------------------

### Other Information

<b>Comments:</b>	New SAU Reactors Project
------------------	--------------------------

10/29/2015

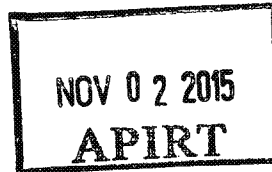
ED\_005146\_00001194-00085

# HUNTSMAN

Enriching lives through innovation

Via Federal Express

October 30, 2015



Air Permits Initial Review Team (APIRT) – MC 161  
Texas Commission on Environmental Quality  
12100 Park 35 Circle  
Building C, Third Floor  
Austin, TX 78753

**RE: Huntsman Petrochemical LLC – Conroe Plant**  
**Permit by Rule 30 TAC §106.261 and §106.262 Registration and Certification**  
**New SAU Reactors Project**  
**Customer Number: CN-603603093**  
**Regulated Entity Number: RN-100219740**

Attn: APIRT

The Huntsman Petrochemical Conroe Plant has prepared the attached documents to notify the Texas Commission on Environmental Quality of the intent to use Permit by Rule 30 TAC §106.261 and §106.262 to authorize fugitive emissions associated with the above referenced project. The attached completed registration form PI-7-CERT and supporting documentation will demonstrate that the general requirements of 30 TAC §106.4 and the specific requirements of 30 TAC §106.261 and §106.262 are met. The \$450 permit fee has been paid online through the commission's ePay system.

If you have any questions, please contact Mark Strohbeck at 936-760-6224.

Sincerely,

A handwritten signature in black ink, appearing to read "Walter R. Stamm".

Walter R. Stamm  
Plant Manager

Enclosure

cc: Air Permits Division, TCEQ Region 12, 5425 Polk Ave., Houston, Texas 77023-1486  
File: ENV CR.10.05.B

Texas Commission on Environmental Quality  
Permits by Rule 106.261 and 106.262 Certified Registration  
for

Huntsman Petrochemical LLC  
Conroe Plant

Conroe, Montgomery County  
Air Quality Account ID No. MQ-0012-Q  
Regulated Entity No. RN100219740  
Customer No. CN603603093

October 2015

Prepared by:

*Bryce M. Wingate*

Bryce Wingate  
Graduate Engineer

Approved by:

*Lk Th*

Sarah Thom, P.E.  
Project Manager



*Lk Th*  
10/26/15

Waid Corporation dba Waid Environmental  
Certificate of Registration No. F-58

**WAID**  
www.waid.com

AUSTIN OFFICE  
10800 PECAN PARK BLVD., SUITE 300  
AUSTIN, TEXAS 78750  
512.255.9999 • 512.255.8780 FAX

HOUSTON OFFICE  
2600 SOUTH SHORE BLVD., SUITE 300  
LEAGUE CITY, TEXAS 77573  
281.333.9990 • 512.255.8780 FAX

MIDLAND OFFICE  
24 SMITH ROAD, SUITE 304  
MIDLAND, TEXAS 79705  
432.682.9999 • 432.682.7774 FAX

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## **GENERAL REQUIREMENTS**

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
PERMIT BY RULE CONSIDERATIONS  
REGULATION 106  
SUBCHAPTER A - GENERAL REQUIREMENTS

### **§106.1. Purpose. (Effective September 4, 2000)**

**This chapter identifies certain types of facilities or changes within facilities which the commission has determined will not make a significant contribution of air contaminants to the atmosphere pursuant to the Texas Health and Safety Code, the Texas Clean Air Act (TCAA), §382.057 and §382.05196.**

#### Huntsman Petrochemical LLC

Permits by Rule 106.261 and 106.262 are being used to authorize emissions from the additional fugitive piping components associated with the new specialty amine unit (SAU) reactors project. The emission rates from these facilities are less than the emission limitations of Permits by Rule 106.261 and 106.262, and therefore will not make a significant contribution of air contaminants to the atmosphere pursuant to state regulatory requirements.

### **§106.2 Applicability. (Effective April 17, 2014)**

**This chapter applies to certain types of facilities or changes within facilities listed in this chapter where construction is commenced on or after the effective date of the relevant permit by rule. This chapter does not apply to emissions of greenhouse gases (as defined in §101.1 of this title (relating to Definitions))**

#### Huntsman Petrochemical LLC

The proposed project qualifies for permit by rule under the most recent versions of 106.261 and 106.262.

### **§106.4 Requirements for Permitting by Rule (Effective April 17, 2014)**

**(a) To qualify for a permit by rule, the following general requirements must be met.**

- (1) Total actual emissions authorized under permit by rule from the facility shall not exceed 250 tons per year (tpy) of carbon monoxide (CO) or nitrogen oxides (NOx); or 25 tpy of volatile organic compounds (VOC) or sulfur dioxide (SO<sub>2</sub>) or inhalable particulate matter (PM); or 15 tpy of particulate matter with diameters of 10 microns or less (PM<sub>10</sub>); or 10 tpy of particulate matter with diameters of 2.5 microns or less (PM<sub>2.5</sub>); or 25 tpy of any other air contaminant except water, nitrogen, ethane, hydrogen, and**

**oxygen; and notwithstanding any provision in any specific permit by rule to the contrary, greenhouse gases as defined in §101.1 of this title (relating to Definitions).**

Huntsman Petrochemical LLC

Total actual emissions authorized by permit by rule from the project are below the emission limits.

- (2) **Any facility or group of facilities, which constitutes a new major stationary source, as defined in §116.12 of this title (relating to Nonattainment and Prevention of Significant Deterioration Review Definitions), or any modification which constitutes a major modification, as defined in §116.12 of this title, under the new source review requirements of the Federal Clean Air Act (FCAA), Part D (Nonattainment) as amended by the FCAA Amendments of 1990, and regulations promulgated thereunder, must meet the permitting requirements of Chapter 116, Subchapter B of this title (relating to New Source Review Permits) and cannot qualify for a permit by rule under this chapter. Persons claiming a permit by rule under this chapter should see the requirements of §116.150 of this title (relating to New Major Source or Major Modification in Ozone Nonattainment Areas) to ensure that any applicable netting requirements have been satisfied.**

Huntsman Petrochemical LLC

Not applicable. The facility does not constitute a new major stationary source or a major modification.

- (3) **Any facility or group of facilities, which constitutes a new major stationary source, as defined in 40 Code of Federal Regulations (CFR) §52.21, or any change which constitutes a major modification, as defined in 40 CFR §52.21, under the new source review requirements of the FCAA, Part C (Prevention of Significant Deterioration) as amended by the FCAA Amendments of 1990, and regulations promulgated thereunder because of emissions of air contaminants other than greenhouse gases, must meet the permitting requirements of Chapter 116, Subchapter B of this title and cannot qualify for a permit by rule under this chapter. Notwithstanding any provision in any specific permit by rule to the contrary, a new major stationary source or major modification which is subject to Chapter 116, Subchapter B, Division 6 of this title due solely to emissions of greenhouse gases may use a permit by rule under this chapter for air contaminants that are not greenhouse gases. However, facilities or projects which require a prevention of significant deterioration permit due to emissions of greenhouse gases may not commence construction or operation until the prevention of significant deterioration permit is issued.**

Huntsman Petrochemical LLC

Not applicable. The facility does not constitute a new major stationary source or a major modification.

- (4) **Unless at least one facility at an account has been subject to public notification and comment as required in Chapter 116, Subchapter B or Subchapter D of this title (relating to New Source Review Permits or Permit Renewals), total actual emissions from all facilities permitted by rule at an account shall not exceed 250 tpy of CO or NOx; or 25 tpy of VOC or SO2 or PM; or 15 tpy of PM10; or 10 tpy of PM2.5; or 25 tpy of any other air contaminant except carbon dioxide, water, nitrogen, methane, ethane, hydrogen, oxygen, and GHGs (as specified in §106.2 of this title (relating to Applicability)).**

Huntsman Petrochemical LLC

The site was subject to public notification and comment during the permitting process for Permit No. 4788.

- (5) **Construction or modification of a facility commenced on or after the effective date of a revision of this section or the effective date of a revision to a specific permit by rule in this chapter must meet the revised requirements to qualify for a permit by rule.**

Huntsman Petrochemical LLC

The project is being authorized pursuant to the most recent versions of Permits by Rule 106.261 and 106.262.

- (6) **A facility shall comply with all applicable provisions of the FCAA, §111 (Federal New Source Performance Standards) and §112 (Hazardous Air Pollutants), and the new source review requirements of the FCAA, Part C and Part D and regulations promulgated thereunder.**

Huntsman Petrochemical LLC

Huntsman Petrochemical LLC will comply with all applicable requirements under 30 TAC Chapter 115 Subchapter D, 40 CFR Part 63 Subchapter H, and 40 CFR Part 63 Subchapter FFFF.

- (7) **There are no permits under the same commission account number that contain a condition or conditions precluding the use of a permit by rule under this chapter.**

Huntsman Petrochemical LLC

There are no permit conditions for this site that exclude the use of a permit by rule.

- (8) The proposed facility or group of facilities shall obtain allowances for NOx if they are subject to Chapter 101, Subchapter H, Division 3 of this title (relating to Mass Emissions Cap and Trade Program).**

Huntsman Petrochemical LLC

Does not apply. There are no facilities in this registration subject to Chapter 101, Subchapter H, Division 3.

- (b) No person shall circumvent by artificial limitations the requirements of §116.110 of this title (relating to Applicability).**

Huntsman Petrochemical LLC

No artificial limitations are employed to circumvent permit requirements.

- (c) The emissions from the facility shall comply with all rules and regulations of the commission and with the intent of the Texas Clean Air Act (TCAA), including protection of health and property of the public, and all emissions control equipment shall be maintained in good condition and operated properly during operation of the facility.**

Huntsman Petrochemical LLC

The facilities will comply with all rules and regulations of the TCEQ and with the intent of the TCAA.

- (d) Facilities permitted by rule under this chapter are not exempted from any permits or registrations required by local air pollution control agencies. Any such requirements must be in accordance with TCAA, §382.113 and any other applicable law.**

Huntsman Petrochemical LLC

Huntsman Petrochemical LLC will adhere to any applicable requirements and laws.

**§106.6. Registration of Emissions. (Effective December 11, 2002)**

- (a) An owner or operator may certify and register the maximum emission rates from facilities permitted by rule under this chapter in order to establish**



**enforceable allowable emission rates which are below the emission limitations in §106.4 of this title (relating to Requirements for Permitting by Rule).**

Huntsman Petrochemical LLC

Huntsman Petrochemical LLC is certifying and registering the maximum emission rates from the facilities under this permit by rule registration.

- (b) All representations with regard to construction plans, operating procedures, and maximum emission rates in any certified registration under this section become conditions upon which the facility permitted by rule shall be constructed and operated.**

Huntsman Petrochemical LLC

Huntsman Petrochemical LLC understands that all representations are conditions upon which the facilities shall be constructed and operated.

- (c) It shall be unlawful for any person to vary from such representation if the change will cause a change in the method of control of emissions, the character of the emissions, or will result in an increase in the discharge of the various emissions, unless the certified registration is first revised.**

Huntsman Petrochemical LLC

Huntsman Petrochemical LLC will not vary from such representations if the change will cause a change in the method of control of emissions, the character of the emissions, or will result in an increase in the discharge of the various emissions, unless the certified registration is first revised.

- (d) The certified registration must include documentation of the basis of emission estimates and a written statement by the registrant certifying that the maximum emission rates listed on the registration reflect the reasonably anticipated maximums for operation of the facility.**

Huntsman Petrochemical LLC

This certified registration includes documentation of the basis of emission estimates. Huntsman Petrochemical LLC certifies that the maximum emission rates listed on the registration reflect the reasonably anticipated maximums for operation of the facilities associated with this project.

- (e) Certified registrations used to demonstrate that Chapter 122 of this title (relating to Federal Operating Permits) does not apply to a source shall be submitted on the required form to the executive director; to the appropriate**

OCTOBER 2015

**commission regional office; and to all local air pollution control agencies having jurisdiction over the site.**

- (1) Certified registrations established prior to the effective date of this rule shall be submitted on or before February 3, 2003.**
- (2) Certified registrations established on or after the effective date of this rule shall be submitted no later than the date of operation.**

Huntsman Petrochemical LLC

This certified registration is not being used to demonstrate that Chapter 122 of this title does not apply.

- (f) All certified registrations shall be maintained on-site and be provided immediately upon request by representatives of the commission or any local air pollution control agency having jurisdiction over the site. If however, the site normally operates unattended, certified registrations and records demonstrating compliance with the certified registration must be maintained at an office within Texas having day-to-day operational control of the site. Upon request, the commission shall make any such records of compliance available to the public in a timely manner.**

Huntsman Petrochemical LLC

A copy of this certified registration will be kept on site and will be provided immediately upon request by representatives of the commission or any local air pollution control agency having jurisdiction over the site.

- (g) Copies of certified registrations shall be included in permit applications subject to review under Chapter 116, Subchapter B of this title (relating to New Source Review Permits).**

Huntsman Petrochemical LLC

A copy of this certified registration will be included in permit applications subject to review under Chapter 116, Subchapter B.

**§106.8. Recordkeeping. (Effective November 1, 2001)**

- (a) Owners or operators of facilities and sources that are de minimis as designated in §116.119 of this title (relating to De Minimis Facilities or Sources) are not subject to this section.**

Huntsman Petrochemical LLC

Does not apply. The facilities included in this permit by rule are not de minimis, as designated in 116.119 of this title.

- (b) Owners or operators of facilities operating under a permit by rule (PBR) in Subchapter C of this chapter (relating to Domestic and Comfort Heating and Cooling) or under those PBRs that only name the type of facility and impose no other conditions in the PBR itself do not need to comply with specific recordkeeping requirements of subsection (c) of this section. A list of these PBRs will be available through the commission's Austin central office, regional offices, and the commission's website. Upon request from the commission or any air pollution control program having jurisdiction, claimants must provide information that would demonstrate compliance with §106.4 of this title (relating to Requirements for Permitting by Rule), or the general requirements, if any, in effect at the time of the claim, and the PBR under which the facility is authorized.**

Huntsman Petrochemical LLC

Does not apply. This registration does not involve a permit by rule in 30 TAC Chapter 106, Subchapter C, or one that only names the type of facility and imposes no other conditions in the permit by rule. Huntsman Petrochemical LLC will comply with the recordkeeping requirements in 106.8(c) below.

- (c) Owners or operators of all other facilities authorized to be constructed and operate under a PBR must retain records as follows:**
  - (1) maintain a copy of each PBR and the applicable general conditions of §106.4 of this title or the general requirements, if any, in effect at the time of the claim under which the facility is operating. The PBR and general requirements claimed should be the version in effect at the time of construction or installation or changes to an existing facility, whichever is most recent. The PBR holder may elect to comply with a more recent version of the applicable PBR and general requirements;**

Huntsman Petrochemical LLC

Huntsman Petrochemical LLC will maintain a copy of the Permits by Rule 106.261 and 106.262, and the applicable general conditions of 106.4 in effect at the time of this application.

- (2) maintain records containing sufficient information to demonstrate compliance with the following:**
  - (A) all applicable general requirements of §106.4 of this title or the general requirements, if any, in effect at the time of the claim; and**

**(B) all applicable PBR conditions;**

Huntsman Petrochemical LLC

Huntsman Petrochemical LLC will maintain records to demonstrate compliance with all applicable general requirements of 106.4 and all applicable Permits by Rule 106.261 and 106.262 conditions.

- (3) keep all required records at the facility site. If however, the facility normally operates unattended, records must be maintained at an office within Texas having day-to-day operational control of the plant site;**

Huntsman Petrochemical LLC

Huntsman Petrochemical LLC will keep all required records at the Conroe Plant.

- (4) make the records available in a reviewable format at the request of personnel from the commission or any air pollution control program having jurisdiction;**

Huntsman Petrochemical LLC

Huntsman Petrochemical LLC will make the records available at the request of personnel from the commission or any air pollution control program having jurisdiction.

- (5) beginning April 1, 2002, keep records to support a compliance demonstration for any consecutive 12-month period. Unless specifically required by a PBR, records regarding the quantity of air contaminants emitted by a facility to demonstrate compliance with §106.4 of this title prior to April 1, 2002 are not required under this section; and**

Huntsman Petrochemical LLC

Huntsman Petrochemical LLC will keep the records required to demonstrate compliance.

- (6) for facilities located at sites designated as major in accordance with §122.10(13) of this title (relating to General Definitions) or subject to or potentially subject to any applicable federal requirement, retain all records demonstrating compliance for at least five years. For facilities located at all other sites, all records demonstrating compliance must be retained for at least two years. These record retention requirements supercede any retention conditions of an individual PBR.**

HUNTSMAN PETROCHEMICAL LLC  
CONROE PLANT  
PERMITS BY RULE 106.261 AND 106.262 CERTIFIED REGISTRATION

OCTOBER 2015

Huntsman Petrochemical LLC

Huntsman Petrochemical LLC will keep records demonstrating compliance for at least five years.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
PERMIT BY RULE CONSIDERATIONS  
REGULATION 106.50  
SUBCHAPTER B - REGISTRATION FEES FOR NEW PERMITS BY RULE

**§106.50. Registration Fees for Permits by Rule. (Effective June 30, 2004)**

- (a) A registrant who submits a permit by rule (PBR) registration for review by the commission shall remit one of the following fees with the PI-7 registration form:**
  - (1) \$100 for:**
    - (A) small businesses, as defined in Texas Government Code, §2006.001; and**
    - (B) non-profit organizations and**
    - (C) municipalities, counties, and independent school districts with populations or districts of 10,000 or fewer residents, according to the most recently published census; or**
  - (2) \$450 for all other entities.**
- (b) This fee does not apply to:**
  - (1) a certification submitted solely for the purpose of establishing a federally enforceable emissions limit under §106.6 of this title (relating to Registration of Emissions);**
  - (2) a remediation project conducted under §106.533 of this title (relating to Water and Soil Remediation); or**
  - (3) resubmittal of previously reviewed registrations, if received within 6 months of a written response on the original action.**
- (c) This fee is for PBR registrations that are received on or after November 1, 2002.**
- (d) All PBR fees will be remitted in the form of a check, certified check, electronic funds transfer, or money order made payable to the Texas Commission on Environmental Quality (TCEQ) and submitted concurrently with the registration to the TCEQ, P.O. Box 13088, MC 214, Austin, Texas 78711-3087. No fees will be refunded.**

Huntsman Petrochemical LLC

The required fee of \$450 was paid online thru ePay TCEQ online payment system.

## **INDIVIDUAL REQUIREMENTS**

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
PERMIT BY RULE CONSIDERATIONS  
REGULATION 106.261

### **§106.261. Facilities (Emission Limitations). (Effective November 1, 2003)**

- (a) Except as specified under subsection (b) of this section, facilities, or physical or operational changes to a facility, are permitted by rule provided that all of the following conditions of this section are satisfied.
- (1) The facilities or changes shall be located at least 100 feet from any recreational area or residence or other structure not occupied or used solely by the owner or operator of the facilities or the owner of the property upon which the facilities are located.

#### Huntsman Petrochemical LLC

The new SAU reactors project is located more than 100 feet from any recreational area or residence or other structure not occupied or used solely by the owner or operator of the facilities or the owner of the property upon which the facilities are located.

- (2) Total new or increased emissions, including fugitives, shall not exceed 6.0 pounds per hour (lb/hr) and ten tons per year of the following materials: acetylene, argon, butane, crude oil, refinery petroleum fractions (except for pyrolysis naphthas and pyrolysis gasoline) containing less than ten volume percent benzene, carbon monoxide, cyclohexane, cyclohexene, cyclopentane, ethyl acetate, ethanol, ethyl ether, ethylene, fluorocarbons Numbers 11, 12, 13, 14, 21, 22, 23, 113, 114, 115, and 116, helium, isohexane, isopropyl alcohol, methyl acetylene, methyl chloroform, methyl cyclohexane, neon, nonane, oxides of nitrogen, propane, propyl alcohol, propylene, propyl ether, sulfur dioxide, alumina, calcium carbonate, calcium silicate, cellulose fiber, cement dust, emery dust, glycerin mist, gypsum, iron oxide dust, kaolin, limestone, magnesite, marble, pentaerythritol, plaster of paris, silicon, silicon carbide, starch, sucrose, zinc stearate, or zinc oxide.

#### Huntsman Petrochemical LLC

The proposed emissions from this project are less than the applicable limits. The emissions from chemicals in the approved chemicals list that are listed above will not exceed the 6.0 lb/hr and 10 tpy emission limits.

- (3) Total new or increased emissions, including fugitives, shall not exceed 1.0 lb/hr of any chemical having a limit value (L) greater than 200 milligrams per cubic meter (mg/m<sup>3</sup>) as listed and referenced in Table 262 of §106.262 of this title (relating to Facilities (Emission and Distance Limitations)) or of any other chemical not listed or referenced in Table 262. Emissions of a chemical with a limit value of less than 200 mg/m<sup>3</sup> are not allowed under this section.

Huntsman Petrochemical LLC

The proposed emissions from this project are less than the applicable limits. Emissions from chemicals in the approved chemicals list having a limit value greater than 200 mg/m<sup>3</sup> or not listed or referenced in Table 262 will not exceed 1.0 lb/hr. Chemicals in the approved chemicals list with a limit value of less than 200 mg/m<sup>3</sup> will be authorized under 106.262.

- (4) For physical changes or modifications to existing facilities, there shall be no changes to or additions of any air pollution abatement equipment.

Huntsman Petrochemical LLC

There will be no change or addition of air pollution abatement equipment associated with this application.

- (5) Visible emissions, except uncombined water, to the atmosphere from any point or fugitive source shall not exceed 5.0% opacity in any six-minute period.

Huntsman Petrochemical LLC

Any visible emissions to the atmosphere associated with this project will not exceed 5.0% opacity in any 6-minute period.

- (6) For emission increases of five tons per year or greater, notification must be provided using Form PI-7 within ten days following the installation or modification of the facilities. The notification shall include a description of the project, calculations, data identifying specific chemical names, limit values, and a description of pollution control equipment, if any.

Huntsman Petrochemical LLC

VOC emissions associated with this project are less than 5 tpy.

- (7) For emission increases of less than five tons per year, notification must be provided using either:



- (A) Form PI-7 within ten days following the installation or modification of the facilities. The notification shall include a description of the project, calculations, data identifying specific chemical names, limit values, and a description of pollution control equipment, if any; or**
- (B) Form PI-7 by March 31 of the following year summarizing all uses of this permit by rule in the previous calendar year. This annual notification shall include a description of the project, calculations, data identifying specific chemical names, limit values, and a description of pollution control equipment, if any.**

Huntsman Petrochemical LLC

The proposed VOC emissions increase is less than 5 tpy. A Form PI-7-CERT and the additional required information are provided with this registration.

**(b) The following are not authorized under this section:**

- (1) Construction of a facility authorized in another section of this chapter or for which a standard permit is in effect; and**
- (2) Any change to any facility authorized under another section of this chapter or authorized under a standard permit.**

Huntsman Petrochemical LLC

Does not apply. Permit by Rule 106.261 is used to authorize VOC emissions from additional fugitive components at the Conroe plant. These VOC emissions are not authorized under another permit by rule or standard permit.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
PERMIT BY RULE CONSIDERATIONS  
REGULATION 106.262

**§106.262. Facilities (Emission and Distance Limitations). (Effective November 1, 2003)**

(a) **Facilities, or physical or operational changes to a facility, are permitted by rule provided that all of the following conditions of this section are satisfied.**

- (1) **Emission points associated with the facilities or changes shall be located at least 100 feet from any off-plant receptor. Off-plant receptor means any recreational area or residence or other structure not occupied or used solely by the owner or operator of the facilities or the owner of the property upon which the facilities are located.**

Huntsman Petrochemical LLC

The new SAU reactors project is located more than 100 feet from the nearest off-plant receptor.

- (2) **New or increased emissions, including fugitives, of chemicals shall not be emitted in a quantity greater than five tons per year nor in a quantity greater than E as determined using the equation  $E = L/K$  and the following table.**

<u>D, Feet</u>	<u>K</u>	
100	326	<b>E = maximum allowable hourly emission, and never to exceed 6 pounds per hour.</b>
200	200	
300	139	
400	104	
500	81	<b>L = value as listed or referenced in Table 262</b>
600	65	
700	54	
800	46	<b>K = value from the table on this page. (interpolate intermediate values)</b>
900	39	
1,000	34	
2,000	14	<b>D = distance to the nearest off-plant receptor.</b>
3,000 or more	8	

**TABLE 262**  
**LIMIT VALUES (L) FOR USE WITH EXEMPTIONS FROM PERMITTING §106.262**

The values are not to be interpreted as acceptable health effects values relative to the issuance of any permits under Chapter 116 of this title (relating to Control of Air Pollution by Permits for New Construction or Modification).

<u>Compound</u>	<u>Limit (L)</u> <u>Milligrams Per Cubic Meter</u>
Acetone	590.
Acetaldehyde	9.
Acetone Cyanohydrin	4.
Acetonitrile	34.
Acetylene	2662.
N-Amyl Acetate	2.7
Sec-Amyl Acetate	1.1
Benzene	3.
Beryllium and Compounds	0.0005
Boron Trifluoride, as HF	0.5
Butyl Alcohol, -	76.
Butyl Acrylate	19.
Butyl Chromate	0.01
Butyl Glycidyl Ether	30.
Butyl Mercaptan	0.3
Butyraldehyde	1.4
Butyric Acid	1.8
Butyronitrile	22.
Carbon Tetrachloride	12.
Chloroform	10.
Chlorophenol	0.2
Chloroprene	3.6
Chromic Acid	0.01
Chromium Metal, Chromium II and III Compounds	0.1
Chromium VI Compounds	0.01
Coal Tar Pitch Volatiles	0.1
Creosote	0.1
Cresol	0.5
Cumene	50.
Dicyclopentadiene	3.1
Diethylaminoethanol	5.5
Diisobutyl Ketone	63.9

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<u>Compound</u>	<u>Limit (L)</u> <u>Milligrams Per Cubic Meter</u>
Dimethyl Aniline	6.4
Dioxane	3.6
Dipropylamine	8.4
Ethyl Acrylate	0.5
Ethylene Dibromide	0.38
Ethylene Glycol	26.
Ethylene Glycol Dinitrate	0.1
Ethylidene-2-norbornene, 5-	7.
Ethyl Mercaptan	0.08
Ethyl Sulfide	1.6
Glycolonitrile	5.
Halothane	16
Heptane	350.
Hexanediamine, 1,6-	0.32
Hydrogen Chloride	1.
Hydrogen Fluoride	0.5
Hydrogen Sulfide	1.1
Isoamyl Acetate	133.
Isoamyl Alcohol	15.
Isobutyronitrile	22.
Kepone	0.001
Kerosene	100.
Malononitrile	8.
Mesityl Oxide	40.
Methyl Acrylate	5.8
Methyl Amyl Ketone	9.4
Methyl-t-butyl ether	45.
Methyl Butyl Ketone	4.
Methyl Disulfide	2.2
Methylenebis (2-chloroaniline) (MOCA)	0.003
Methylene Chloride	26.
Methyl Isoamyl Ketone	5.6
Methyl Mercaptan	0.2
Methyl Methacrylate	34.
Methyl Propyl Ketone	530.
Methyl Sulfide	0.3
Mineral Spirits	350.
Naphtha	350.
Nickel, Inorganic Compounds	0.015

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<u>Compound</u>	<u>Limit (L)</u> <u>Milligrams Per Cubic Meter</u>
Nitroglycerine	0.1
Nitropropane	5.
Octane	350.
Parathion	0.05
Pentane	350.
Perchloroethylene	33.5
Petroleum Ether	350
Phenyl Mercaptan	0.4
Propionitrile	14.
Propyl Acetate	62.6
Propylene Oxide	20.
Propyl Mercaptan	0.23
Silica-amorphous- precipitated, silica gel	4.
Silicon Carbide	4.
Stoddard Solvent	350.
Styrene	21.
Succinonitrile	20.
Tolidine	0.02
Trichloroethylene	135.
Trimethylamine	0.1
Valeric Acid	0.34
Vinyl Acetate	15.
Vinyl Chloride	2.

NOTE: The time weighted average (TWA) Threshold Limit Value (TLV) published by the American Conference of Governmental Industrial Hygienists (ACGIH), in its TLVs and BEIs guide (1997 Edition) shall be used for compounds not included in the table. The Short Term Exposure Level (STEL) or Ceiling Limit (annotated with a "C") published by the ACGIH shall be used for compounds that do not have a published TWA TLV. This section cannot be used if the compound is not listed in the table or does not have a published TWA TLV, STEL, or Ceiling Limit in the ACGIH TLVs and BEIs guide.

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New or increased emissions from this project do not exceed 5 tpy. New and increased hourly emissions of propylene oxide are below the maximum allowable hourly emissions (E), as calculated from  $E = L/K$ , and K being equal to 39 based on a distance of at least 900 feet to the nearest off-plant receptor. Calculations and analysis can be found in the Emission Data Section of this registration and include estimated emission rates.

- (3) Notification must be provided using Form PI-7 within ten days following the installation or modification of the facilities. The notification shall include a description of the project, calculations, and data identifying specific chemical names, L values, D values, and a description of pollution control equipment, if any.

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A Form PI-7-CERT is being provided in this permit by rule registration within ten days following the installation of the new SAU reactors project. Project description information, calculations, data identifying specific chemical names, L values, and D values are included in this registration document. Calculations are shown in the Emissions Data Section.

- (4) The facilities in which the following chemicals will be handled shall be located at least 300 feet from the nearest property line and 600 feet from any off-plant receptor and the cumulative amount of any of the following chemicals resulting from one or more authorizations under this section (but not including permit authorizations) shall not exceed 500 pounds on the plant property and all listed chemicals shall be handled only in unheated containers operated in compliance with the United States Department of Transportation regulations (49 Code of Federal Regulations, Parts 171-178): acrolein, allyl chloride, ammonia (anhydrous), arsine, boron trifluoride, bromine, carbon disulfide, chlorine, chlorine dioxide, chlorine trifluoride, chloroacetaldehyde, chloropicrin, chloroprene, diazomethane, diborane, diglycidyl ether, dimethylhydrazine, ethyleneimine, ethyl mercaptan, fluorine, formaldehyde (anhydrous), hydrogen bromide, hydrogen chloride, hydrogen cyanide, hydrogen fluoride, hydrogen selenide, hydrogen sulfide, ketene, methylamine, methyl bromide, methyl hydrazine, methyl isocyanate, methyl mercaptan, nickel carbonyl, nitric acid, nitric oxide, nitrogen dioxide, oxygen difluoride, ozone, pentaborane, perchloromethyl mercaptan, perchloryl fluoride, phosgene, phosphine, phosphorus trichloride, selenium hexafluoride, stibine, liquified sulfur dioxide, sulfur pentafluoride, and tellurium hexafluoride. Containers of these chemicals may not be vented or opened directly to the atmosphere at any time.

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Chemicals listed in 106.262(a)(4) will be located at least 300 feet from the nearest property line and 600 feet from any off-plant receptor, and the cumulative amount of any of the following chemicals resulting from one or more authorizations under this sections shall not exceed 500 pounds on the plant property. Containers will be unheated and not vented or opened to the atmosphere at any time.

- (5) For physical changes or modifications to existing facilities, there shall be no changes or additions of air pollution abatement equipment.

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There will be no changes or additions of any air pollution abatement equipment associated with this permit rule registration.

- (6) Visible emissions, except uncombined water, to the atmosphere from any point or fugitive source shall not exceed 5.0% opacity in any six-minute period.**

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Any visible emissions to the atmosphere associated with this project will not exceed 5.0% opacity in any six-minute period.

- (b) The following are not authorized under this section except as noted in subsection (c):**
- (1) Construction of a facility authorized in another section of this chapter or for which a standard permit is in effect; and**
  - (2) Any change to any facility authorized under another section of this chapter or authorized under a standard permit.**
- (c) If a facility has been authorized under another section of this chapter or under a standard permit, subsection (a)(2) and (3) of this section may be used to qualify the use of other chemicals at the facility.**

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Does not apply. Permit by Rule 106.262 is used to authorize VOC emissions from the additional fugitive components associated with the new SAU reactors project at the Conroe plant. These VOC emissions are not authorized under another permit by rule or standard permit.

HUNTSMAN PETROCHEMICAL LLC  
CONROE PLANT  
PERMITS BY RULE 106.261 AND 106.262 CERTIFIED REGISTRATION

OCTOBER 2015

**PROCESS FLOW DIAGRAM**

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# NEW SAU REACTORS PROJECT FUGITIVES

EPN: SAUFUG



SPECIALTY AMINE UNIT  
FUGITIVES

<b>WALD</b> ENVIRONMENTAL				
HUNTSMAN PETROCHEMICAL CORPORATION				
NEW SAU REACTORS PROJECT FUGITIVES				
Client ID	10/20/15	10/22/15	FUGFLOW	2
\\H:\CLIENTS\HUNTSMAN CONROE\HCC8410\PR261262 NEW SAU REACTORS\ACAD				

## **PROCESS DESCRIPTION**

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### **Background**

The Huntsman Conroe Specialty Amines Unit (SAU) makes two families of products: methylated amines including ZF10, DMAEE and ZR70 and non-methylated including APM, DMAPA, MOPA, and APDEA. These two families require different catalyst. In order to change production from one family to the other, Huntsman has historically had to open the reactors, drop the catalyst, package and store for future use, and refill the reactors with the other catalyst. This is a labor intensive job with associated safety concerns, causes degradation to the expensive catalyst, creates the potential to damage the reactor heads or gaskets which may result in leaks, as well as extending the downtime between product runs. In order to alleviate these issues, Huntsman has added two new reactors to the unit which will contain one catalyst while the other catalyst will remain in the old reactors. The old reactors and new reactors will not be used at the same time, neither in series nor in parallel, and the new reactors will not cause a production increase either on an hourly or an annual basis. All of the upstream and downstream components of the unit are unaffected.

### **Process Description**

Raw materials are piped into the new SAU reactors at high pressure where they undergo a catalyzed reaction. The new reactors will be used to produce one family of products while the old reactors will be used to produce the other. They will not be fed at the same time.

This submittal authorizes the addition of fugitive components associated with the new SAU reactors project. Huntsman proposes to authorize the fugitive emissions under Permits by Rule No. 106.261 and 106.262. The chemical list included in this submittal shows the various chemicals that the fugitive components may come in contact with.

The new SAU reactors project will not increase the annual or hourly production capacity at the site. Huntsman is not proposing an increase to the production limit. As such, there will be no upstream or downstream impacts from the second reactor train.

## **EMISSIONS DATA AND CALCULATIONS**

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### **Equipment Leak Fugitives**

Equipment leak fugitives are estimated based on a source count for the piping installed. The emission factors used for this facility are SOCMI without ethylene factors from the TCEQ Guidance Document, "Equipment Leak Fugitives," dated October 2000. Control efficiencies are based on a 28 VHP Leak Detection & Repair Program combined with quarterly flange monitoring. Emission rate estimation calculations are attached.

**EMISSIONS SUMMARY**

EPN	DESCRIPTION	TOTAL VOC	
		(lb/hr)	(tons/yr)
(--)	(--)		
SAUFUG	SAU Fugitives	0.0058	0.025
<b>TOTAL</b>		<b>0.0058</b>	<b>0.025</b>

**§106.261 & §106.262 – Requirement Verification**

Chemical (–)	L (mg/m3)	K (900 ft)	Hourly Rate Limit (lb/hr)	Hourly Emission Rate (lb/hr)	Authorization	Meets Authorization
Representative <sup>1</sup>	–	–	6.0	0.0058	106.261(a)(2)	YES
Representative <sup>2</sup>	–	–	1.0	0.0058	106.261(a)(3)	YES
Representative <sup>3</sup>	0.37	39	0.0095	0.0058	106.262	YES

1. Represents worst-case chemical listed on the approved chemicals list authorized under 106.261(a)(2).
2. Represents worst-case chemical listed on the approved chemicals list authorized under 106.261(a)(3).
3. Represents worst-case chemical listed on the approved chemicals list authorized under 106.262: formcel, formaldehyde 50% solution, or formalin.

**VOC FUGITIVE EMISSIONS SUMMARY SHEET**

**Facility Information**

FIN	SAUFUG
EPN	SAUFUG
Hours of Operation	8760

**Total Emissions Estimates**

Equipment Type	Component Count	Emission Factor <sup>1</sup>	Control Efficiency <sup>2,3</sup>	Emissions Rate (lb/hr)	Emissions Rate (tons/yr)
Valves - Gas/Vapor	0	0.0089	0.97	0	0
Valves - Light Liquid	54	0.0035	0.97	0.00567	0.02483
Valves - Heavy Liquid	0	0.0007	0.30	0	0
				0	0
Pumps - Light Liquid	0	0.0386	0.85	0	0
Pumps - Light Liquid - sealed	0	0.0386	1.00	0	0
Pumps - Heavy Liquid	0	0.0161	0.85	0	0
				0	0
Connectors - Gas/Vapor	0	0.0029	1.00	0	0
Connectors - Light Liquid - Flanged	5	0.0005	0.97	0.00008	0.00033
Connectors - Light Liquid - Welded	184	0.0005	1.00	0	0
Connectors - Heavy	0	0.00007	1.00	0	0
<b>Total Emissions</b>				<b>0.00575</b>	<b>0.02520</b>

**NOTES:**

(1) SOCMI w/o ethylene emission factors

(2) Control factors are based on a 28VHP Leak Detection and Repair Program with 500 ppm quarterly flange monitoring.

(3) Welded connectors are sealed

Example calculation for valves servicing Light Liquid:

Maximum Hourly Emission Rate:

$$\frac{54 \text{ Valves} \times 0.0035 \text{ lb VOC}}{\text{valve hour}} \times \frac{(1 - 0.97) \text{ lb VOC}}{1 \text{ lb VOC}} = 0.00567 \text{ lb/hr VOC}$$

Annual Average Emission Rate

$$\frac{0.00567 \text{ lb VOC}}{\text{hr}} \times \frac{1 \text{ ton VOC}}{2000 \text{ lb VOC}} \times \frac{8760 \text{ hours}}{\text{year}} = 0.02483 \text{ ton/yr VOC}$$

Huntsman Petrochemical LLC - Conroe  
Approved Chemical List

Constituent	L value mg/m <sup>3</sup>	Source of TLV	Exemption No.
1,3-cyclohexane-dicarboxaldehyde	NA		106.261(a)(3)
1,4-cyclohexane-dicarboxaldehyde	NA		106.261(a)(3)
1,4-dioxane	90	1997 TLVs and BEI	106.262
1-Butanol/EO/PO copolymer	NA		106.261(a)(3)
1-Propanamine, 3,3'-[1,2-ethanediylbis(oxy)]bis-	NA		106.261(a)(3)
1-Propanamine, 3-butoxy	NA		106.261(a)(3)
2,2'-(1,2-ethanediylbis(oxy)bix(N,N-dimethyl)ethaneamine	NA		106.261(a)(3)
2,2'-(methylimino)bis-ethanol	NA		106.261(a)(3)
2,2',2'',2'''-(1,2-Ethanediylidinitrilo) tetrakisethanol	NA		106.261(a)(3)
2,5-Dimethylmorpholine	NA		106.261(a)(3)
2-[[2-(2-Dimethylamino) ethoxy] ethyl] methylamino] ethanol	NA		106.261(a)(3)
2-aminoethoxyethanol	NA		106.261(a)(3)
2-ethylhexanoic acid	NA		106.261(a)(3)
2-Methoxyethanol	16	1997 TLVs and BEI	106.262
2-propanol	983	1997 TLVs and BEI	106.262
2-propanol, 1-(bis(3-(dimethylamino)propyl)amino)-	NA		106.261(a)(3)
2-propanol,1,1'-((3-(dimethylamino)propyl)imino)bis-	NA		106.261(a)(3)
2-vinyloxyethanol	NA		106.261(a)(3)
3-[2-(dimethylamino)ethoxy]propanenitrile	NA		106.261(a)(3)
4-Methoxyphenol	5	1997 TLVs and BEI	106.262
4-Methyl-2-Morpholinone	NA		106.261(a)(3)
4-methyl-2-pentanol	104	1997 TLVs and BEI	106.262
ACCELERATOR 399	NA		106.261(a)(3)
ACCELERATOR 60	NA		106.261(a)(3)
ACCELERATOR 81	NA		106.261(a)(3)
Acetic acid	25	1997 TLVs and BEI	106.262
Acetone	1188	1997 TLVs and BEI	106.262
Acrylonitrile	4.3	1997 TLVs and BEI	106.262
AEAA Crude Byproduct	NA		106.261(a)(3)
AEAA Crude Feed	NA		106.261(a)(3)
Alcohol Alkoxylates	NA		106.261(a)(3)
Alcohol Ethoxylate Polyalkoxyamine	NA		106.261(a)(3)
Alcohol Polyalkoxyamine	NA		106.261(a)(3)
Alcohols, C10-16	NA		106.261(a)(3)
Alfol® 1216 Alcohol	NA		106.261(a)(3)
Alcyclic amine	NA		106.261(a)(3)
Aliphatic polyether triamine	NA		106.261(a)(3)
Aliphatic polyetheramine	NA		106.261(a)(3)
Alkarylpoloxybutylene alcohol	NA		106.261(a)(3)
Alkoxyated ethylene diamine	NA		106.261(a)(3)
Alkyl ether amine	NA		106.261(a)(3)
Alkyletheramine	NA		106.261(a)(3)
Alkylphenol alkoxylate	NA		106.261(a)(3)
Alkylphenoxypolyalkoxyamine	NA		106.261(a)(3)
Alkylphenylpolyetheramine	NA		106.261(a)(3)
Alkylpoly(oxyalkylene)amine	NA		106.261(a)(3)
Aminated C8-C20 Alcohol Alkoxylates	NA		106.261(a)(3)
Amine C-12	NA		106.261(a)(3)
Amine C-4	NA		106.261(a)(3)
Amine C-7 (MDEA Residue)	NA		106.261(a)(3)
Amine Mix	NA		106.261(a)(3)
amine terminated urea condensate with JEFFAMINE® D-400	NA		106.261(a)(3)
Amines	NA		106.261(a)(3)
Aminoethylethanolamine	NA		106.261(a)(3)
Aminoethylpiperazine	NA		106.261(a)(3)
Aminopropyl methoxy diethylene glycol	NA		106.261(a)(3)
Aminopropylidethanolamine	NA		106.261(a)(3)
Aminopropylmonomethylethanolamine	NA		106.261(a)(3)
Aminopropylmorpholine	NA		106.261(a)(3)
Ammonia	17	1997 TLVs and BEI	106.262
AMU Residue	NA		106.261(a)(3)
Antifoam	NA		106.261(a)(3)
APDEA Feed	2	1997 TLVs and BEI	106.262
BASF AMIX DA5	NA		106.261(a)(3)
Benzene, C14-30 alkyl derivatives	NA		106.261(a)(3)
Benzylidimethylamine	NA		106.261(a)(3)

Bis (dimethylaminoethyl) ether	NA		106.261(a)(3)
bis( urea ) of JEFFAMINE® D-2000	NA		106.261(a)(3)
Bisaminoethylether	NA		106.261(a)(3)
Bisphenol A diglycidyl ether	NA		106.261(a)(3)
Butylene Carbonate	NA		106.261(a)(3)
Butylene Carbonate Catalyst	NA		106.261(a)(3)
Butylene Oxide	NA		106.261(a)(3)
C12-C14 Alkyl Alcohol	NA		106.261(a)(3)
C40-C80 Olefins	NA		106.261(a)(3)
CARPOL GP-6515	NA		106.261(a)(3)
Caustic Glycol Bottoms	NA		106.261(a)(3)
Crude Ethylene Carbonate	NA		106.261(a)(3)
Crude NEM	NA		106.261(a)(3)
Crude NMM	NA		106.261(a)(3)
Crude Propylene Carbonate	NA		106.261(a)(3)
Cyanocyclohexanecarboxyaldehyde	NA		106.261(a)(3)
Cyanoethylmorpholine	NA		106.261(a)(3)
Cyclohexane	1030	1997 TLVs and BEI	106.262
Diethanolamine 95-99%/Ethanolamine (1-3%)	2	1997 TLVs and BEI	106.262
Diethanolamine	2	1997 TLVs and BEI	106.262
Diethylamine	15	1997 TLVs and BEI	106.262
Diethylene Glycol	NA		106.261(a)(3)
Diethyleneglycol monobutylether	NA		106.261(a)(3)
Diethylenetriamine	4.2	1997 TLVs and BEI	106.262
Diethylethanolamine	9.6	1997 TLVs and BEI	106.262
Diethyltoluenediamine	NA		106.261(a)(3)
Diglycolamine	NA		106.261(a)(3)
Diisopropanolamine	NA		106.261(a)(3)
Dimethyl Sulfoxide (DMSO)	NA		106.261(a)(3)
Dimethylamine	9.2	1997 TLVs and BEI	106.262
Dimethylaminoethoxyethanol	NA		106.261(a)(3)
Dimethylaminoethoxypropylamine	NA		106.261(a)(3)
Dimethylaminopropionitrile	NA		106.261(a)(3)
Dimethylaminopropylamine	NA		106.261(a)(3)
Dimethylcyclohexanolamine	NA		106.261(a)(3)
Dimethyldiglycolamine	NA		106.261(a)(3)
Dimethylethanolamine	NA		106.261(a)(3)
Dimethylethanolamine 50%	NA		106.261(a)(3)
Dimethylpiperazine	NA		106.261(a)(3)
Dimorpholinediethylether	NA		106.261(a)(3)
Dimorpholinoethane	NA		106.261(a)(3)
Dipropylene glycol	NA		106.261(a)(3)
DMDEE Crude	NA		106.261(a)(3)
DMDEE Residue	NA		106.261(a)(3)
DMEA Residue	NA		106.261(a)(3)
DMEA W/P	NA		106.261(a)(3)
dodecylphenoxypolybutoxypropionitrile	NA		106.261(a)(3)
Dowanol® DPM Glycol Ether	NA		106.261(a)(3)
Dowtherm Q	NA		106.261(a)(3)
Eastman(TM) CHDM-D	NA		106.261(a)(3)
EDA Alkoxylates	NA		106.261(a)(3)
EG/ BO/ Cyclohexyldimethylamine polymer	NA		106.261(a)(3)
ELASTAMINE® HE-1700	NA		106.261(a)(3)
EMI-936	NA		106.261(a)(3)
EMI-939	NA		106.261(a)(3)
Ethanol	1880	1997 TLVs and BEI	106.262
Ethanol (denatured)	1880	1997 TLVs and BEI	106.262
Ethanol, 2,2'-oxybis-, reaction products with ammonia, morpholine derivs. Residues	NA		106.261(a)(3)
Ethoxylated methyldiethanolamine adducts	NA		106.261(a)(3)
Ethyl Acetate	NA		106.261(a)(3)
Ethyl Bromide	22	1997 TLVs and BEI	106.262
Ethylene Carbonate	NA		106.261(a)(3)
Ethylene Carbonate Catalyst	NA		106.261(a)(3)
Ethylene Glycol	100	1997 TLVs and BEI	106.262
Ethylene Oxide	1.8	1997 TLVs and BEI	106.262
Ethylene oxide/propylene oxide copolymer	NA		106.261(a)(3)
Ethylenediamine	25	1997 TLVs and BEI	106.262
Formaldehyde 50% Solution	0.37	1997 TLVs and BEI	106.262
Formalin	0.37	1997 TLVs and BEI	106.262
Formcel	0.37	1997 TLVs and BEI	106.262



Formic acid	9.4	1997 TLVs and BEI	106.262
Glycerol polyether	NA		106.261(a)(3)
Glyceryl (polyoxyethylene) ether	NA		106.261(a)(3)
Glyceryl poly(oxypropylene) triamine	NA		106.261(a)(3)
Glyceryl poly(oxypropylene) triamine	NA		106.261(a)(3)
Glyceryl Polyoxyalkylene Triamine	NA		106.261(a)(3)
Hydrogen peroxide	NA		106.261(a)(3)
Hydroxyethoxyethylmorpholine	NA		106.261(a)(3)
Hydroxyethylmorpholine	NA		106.261(a)(3)
Hydroxyethylpiperazine	NA		106.261(a)(3)
Iminobispropylamine	NA		106.261(a)(3)
Int./waste from DMAPA production	NA		106.261(a)(3)
Isophorone diamine	NA		106.261(a)(3)
Isopropylamine	12	1997 TLVs and BEI	106.262
Isopropylmorpholine	NA		106.261(a)(3)
JEFFADD BAEE-EO	NA		106.261(a)(3)
JEFFAMINE® D-630	NA		106.261(a)(3)
JEFFAMINE® ED-3600	NA		106.261(a)(3)
JEFFAMINE® polyetheramines	NA		106.261(a)(3)
JEFFAMINE® RFD 270	NA		106.261(a)(3)
JEFFCAT® 271	NA		106.261(a)(3)
JEFFCAT® 283	NA		106.261(a)(3)
JEFFCAT® DM-70	NA		106.261(a)(3)
JEFFCAT® DMEA 80	NA		106.261(a)(3)
JEFFCAT® DPO catalyst	NA		106.261(a)(3)
JEFFCAT® ERC-219	NA		106.261(a)(3)
JEFFCAT® HS	NA		106.261(a)(3)
JEFFCAT® LE 425	NA		106.261(a)(3)
JEFFCAT® LE-11210	NA		106.261(a)(3)
JEFFCAT® LE-15	NA		106.261(a)(3)
JEFFCAT® LE-210	NA		106.261(a)(3)
JEFFCAT® LE-220	NA		106.261(a)(3)
JEFFCAT® LE-225	NA		106.261(a)(3)
JEFFCAT® LE-295	NA		106.261(a)(3)
JEFFCAT® LE-30	NA		106.261(a)(3)
JEFFCAT® LE-30A	NA		106.261(a)(3)
JEFFCAT® LE-310	NA		106.261(a)(3)
JEFFCAT® LE-35	NA		106.261(a)(3)
JEFFCAT® LED 204	NA		106.261(a)(3)
JEFFCAT® LED-101	NA		106.261(a)(3)
JEFFCAT® LED-103	NA		106.261(a)(3)
JEFFCAT® LEG DPG	NA		106.261(a)(3)
JEFFCAT® LPO catalyst	NA		106.261(a)(3)
JEFFCAT® M-75	NA		106.261(a)(3)
JEFFCAT® MM-70	NA		106.261(a)(3)
JEFFCAT® NEM	24	1997 TLVs and BEI	106.262
JEFFCAT® NMM	NA		106.261(a)(3)
JEFFCAT® PM	NA		106.261(a)(3)
JEFFCAT® S-117	NA		106.261(a)(3)
JEFFCAT® S-127	NA		106.261(a)(3)
JEFFCAT® TD-20	NA		106.261(a)(3)
JEFFCAT® TD-33A	NA		106.261(a)(3)
JEFFCAT® TR-52	NA		106.261(a)(3)
JEFFCAT® TR-63 Catalyst	NA		106.261(a)(3)
JEFFCAT® WTB-70	NA		106.261(a)(3)
JEFFCAT® Z 65	NA		106.261(a)(3)
JEFFCAT® Z-131	NA		106.261(a)(3)
JEFFCAT® Z-177	NA		106.261(a)(3)
JEFFCAT® Z-47	NA		106.261(a)(3)
JEFFCAT® Z-65D	NA		106.261(a)(3)
JEFFCAT® Z-65P	NA		106.261(a)(3)
JEFFCAT® Z-77	NA		106.261(a)(3)
JEFFCAT® Z-83	NA		106.261(a)(3)
JEFFCAT® ZF 22	NA		106.261(a)(3)
JEFFCAT® ZF 24	NA		106.261(a)(3)
JEFFCAT® ZF 26	NA		106.261(a)(3)
JEFFCAT® ZF-123	NA		106.261(a)(3)
JEFFCAT® ZF-125	NA		106.261(a)(3)
JEFFCAT® ZF-135	NA		106.261(a)(3)
JEFFCAT® ZF-167	NA		106.261(a)(3)

JEFFCAT® ZF-230A	NA		106.261(a)(3)
JEFFCAT® ZF-43	NA		106.261(a)(3)
JEFFCAT® ZF-456	NA		106.261(a)(3)
JEFFCAT® ZF-52	NA		106.261(a)(3)
JEFFCAT® ZF-53	NA		106.261(a)(3)
JEFFCAT® ZF-54	NA		106.261(a)(3)
JEFFCAT® ZF-72	NA		106.261(a)(3)
JEFFCAT® ZFP-153	NA		106.261(a)(3)
JEFFCAT® ZR-81	NA		106.261(a)(3)
JEFFOL® R-290	NA		106.261(a)(3)
JEFFOL® R-425X	NA		106.261(a)(3)
JEFFOL® SF-265	NA		106.261(a)(3)
JEFFOX® G-400	NA		106.261(a)(3)
JEFFSOL® EC-25	NA		106.261(a)(3)
JEFFSOL® EC-50	NA		106.261(a)(3)
JEFFTREAT® AO-832	NA		106.261(a)(3)
JEFFTREAT® M-500 ADDITIVE	NA		106.261(a)(3)
JEFFTREAT® M-505	NA		106.261(a)(3)
JEFFTREAT® M-507	NA		106.261(a)(3)
JEFFTREAT® M-510	NA		106.261(a)(3)
JEFFTREAT® MP	NA		106.261(a)(3)
JEFFTREAT® MP-442	NA		106.261(a)(3)
JEFFTREAT® MS-100	NA		106.261(a)(3)
JEFFTREAT® MS-150	NA		106.261(a)(3)
JEFFTREAT® MS-203	NA		106.261(a)(3)
JEFFTREAT® MS-205	NA		106.261(a)(3)
JEFFTREAT® MS-205LFG	NA		106.261(a)(3)
JEFFTREAT® MS-300	NA		106.261(a)(3)
JEFFTREAT® MS-350	NA		106.261(a)(3)
JFFE4842	NA		106.261(a)(3)
Lactic Acid	NA		106.261(a)(3)
LE 60 Bottoms	NA		106.261(a)(3)
Methanol	262	1997 TLVs and BEI	106.262
Methanol 6EO Adduct	NA		106.261(a)(3)
Methoxy poly (oxyethylene/oxypropylene) -2-propylamine	NA		106.261(a)(3)
Methoxyethylmorpholine	NA		106.261(a)(3)
Methoxypoly(oxyethylene/oxypropylene)-2-propanol	NA		106.261(a)(3)
Methoxypolyoxyalkylene-2-propylamine	NA		106.261(a)(3)
Methoxypropionitrile	NA		106.261(a)(3)
Methoxypropylamine	NA		106.261(a)(3)
Methylamine	6.4	1997 TLVs and BEI	106.262
Methyldiethanolamine	NA		106.261(a)(3)
Methyldiethanolamine-EO adduct	NA		106.261(a)(3)
Methylmonoethanolamine	NA		106.261(a)(3)
MMEA Crude	NA		106.261(a)(3)
Monoethanolamine	7.5	1997 TLVs and BEI	106.262
Monomethylamine	6.4	1997 TLVs and BEI	106.262
Monononylphenol	NA		106.261(a)(3)
Morpholine	71	1997 TLVs and BEI	106.262
MPG 200 PC, EXPERIMENTAL	NA		106.261(a)(3)
MPPG-300	NA		106.261(a)(3)
MPPG-300 Unneutralized	NA		106.261(a)(3)
N,N,N' dimethylaminopropyl hexa hydro triazine	NA		106.261(a)(3)
N,N'-bis(2-propyl)polyoxypropylenediamine	NA		106.261(a)(3)
N-[3-(Dimethylamino)propyl]-N,N',N'-trimethylpropane-1,3-diamine	NA		106.261(a)(3)
n-butyl alcohol	152	1997 TLVs and BEI	106.262
N-butylmorpholine	NA		106.261(a)(3)
NEM Residue	NA		106.261(a)(3)
N-ethylmorpholine	24	1997 TLVs and BEI	106.262
N-formyl morpholine	NA		106.261(a)(3)
n-Heptane	NA		106.261(a)(3)
N-hydroxyethyl DETA	NA		106.261(a)(3)
N-Methylmorpholine	NA		106.261(a)(3)
NMM Residue	NA		106.261(a)(3)
Nonylphenol, ethoxylated	NA		106.261(a)(3)
Oxirane, methyl-, polymer w/ alpha-hydro-omega-hydroxypoly (oxy-1,4-butanediyl)	NA		106.261(a)(3)
Oxirane, methyl-, polymer w/ alpha-hydro-omega-hydroxypoly (oxy-1,4-butanediyl)	NA		106.261(a)(3)
Oxirane, methyl-, polymer w/ oxirane, mono-butyl ether	NA		106.261(a)(3)
Oxirane, methyl-, polymer w/1,2,3 propanetriol	NA		106.261(a)(3)
Oxirane, methyl-, polymer w/oxirane	NA		106.261(a)(3)

Oxirane, methyl-, polymer with alpha-hydro-omega-hydroxypoly (oxy-1,4-butanediyl)	NA		106.261(a)(3)
Oxirane, methyl-, polymer w/ oxirane, bis(2-aminopropyl)ether	NA		106.261(a)(3)
Oxirane, methyl-, polymer w/ alpha-hydro-omega-hydroxypoly (oxy-1,4-butanediyl), bis(2-aminomethylethyl)ether	NA		106.261(a)(3)
Paraffins (C7-C20)	NA		106.261(a)(3)
PED-3600	NA		106.261(a)(3)
PENNSTOP 85%	NA		106.261(a)(3)
Pentaethylenehexamine	NA		106.261(a)(3)
Pentamethyldiethylenetriamine	NA		106.261(a)(3)
Phenol	19	1997 TLVs and BEI	106.262
Phenothiazine	5	1997 TLVs and BEI	106.262
Phosphoric acid	1	1997 TLVs and BEI	106.262
Piperazine	NA		106.261(a)(3)
Piperazine Eutectic	NA		106.261(a)(3)
PNP-1047	NA		106.261(a)(3)
POGOL® 400	NA		106.261(a)(3)
Poly(oxy(methyl-1,2-ethanediyl)), alpha-(2-aminomethylethyl)omega-(2-aminomethylethoxy)	NA		106.261(a)(3)
Poly(oxy(methyl-1,2-ethanediyl)), alpha-hydro-omega-hydroxy	NA		106.261(a)(3)
Poly(oxy(methyl-1,2-ethanediyl)), alpha-hydro-omega-hydroxy-, ether w/ 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1)	NA		106.261(a)(3)
Poly(oxy(ethyl-1,2-ethanediyl)), alpha-(2-aminoethylethyl)-omega-(2-aminoethylethoxy)-, polymer with oxirane & oxirane, methyl	NA		106.261(a)(3)
Poly(oxy-1,2-ethanediyl), alpha-hydro-omega-hydroxy	NA		106.261(a)(3)
Poly(oxy-1,4-butanediyl), alpha-hydro-omega-hydroxy-, polymer w/ ammonia	NA		106.261(a)(3)
Poly(oxyalkylene)polymer	NA		106.261(a)(3)
Poly[oxy(methyl-1,2-ethanediyl)], alpha-butyl-omega-hydroxy-	NA		106.261(a)(3)
Poly[oxy(methyl-1,2-ethanediyl)], alpha, alpha'-(oxydi-2,1-ethanediyl)bis[omega-(aminomethylethoxy)-]	NA		106.261(a)(3)
Polyacrylic acid	NA		106.261(a)(3)
Polyether polyol	NA		106.261(a)(3)
Polyether polyol blend	NA		106.261(a)(3)
Polyetheramine	NA		106.261(a)(3)
Polyetheramine derivative	NA		106.261(a)(3)
Polyetheramines	NA		106.261(a)(3)
Polyethylene Glycol 1000	NA		106.261(a)(3)
PolyFroth® W22C Crude	NA		106.261(a)(3)
PolyFroth® W31	NA		106.261(a)(3)
Polyol	NA		106.261(a)(3)
Polyol PRFD-270	NA		106.261(a)(3)
Polyoxyalkylene alkyl ether	NA		106.261(a)(3)
Polyoxyalkylene Amine	NA		106.261(a)(3)
Polyoxyalkyleneamine	NA		106.261(a)(3)
Polyoxypropylene triamine	NA		106.261(a)(3)
Polyoxypropylenediamine	NA		106.261(a)(3)
Polypropylene glycol	NA		106.261(a)(3)
polytetramethylene ether glycol	NA		106.261(a)(3)
Potassium Hydroxide	2	1997 TLVs and BEI	106.262
PRECURSOR PT-360	NA		106.261(a)(3)
Propanediamine	NA		106.261(a)(3)
Proprietary Amine	NA		106.261(a)(3)
Proprietary component	NA		106.261(a)(3)
Proprietary Components	NA		106.261(a)(3)
Proprietary Components	NA		106.261(a)(3)
Propylene Carbonate	NA		106.261(a)(3)
Propylene Carbonate Catalyst	NA		106.261(a)(3)
Propylene Glycol	NA		106.261(a)(3)
Propylene Glycol Methyl Ether (PGME)	NA		106.261(a)(3)
Propylene Oxide	48	1997 TLVs and BEI	106.262
PT-403 w/DMCHA	NA		106.261(a)(3)
PXTJ718	NA		106.261(a)(3)
Secondary Polyether Amines	NA		106.261(a)(3)
SF1505A	NA		106.261(a)(3)
Sodium borohydride	NA		106.261(a)(3)
Sodium methylate	NA		106.261(a)(3)
Sodium methylate 25%	NA		106.261(a)(3)
Sucrose	10	1997 TLVs and BEI	106.262
Sulfuric Acid	1	1997 TLVs and BEI	106.262
SURFONIC® EDA4/80	NA		106.261(a)(3)
SURFONIC® POA-L62LF	NA		106.261(a)(3)
Talioil fatty acids	NA		106.261(a)(3)
T-E-40/T-F-2 Waste	NA		106.261(a)(3)
Terrathane2000 (Ptmeg2000)	NA		106.261(a)(3)
tert-Butyl alcohol	303	1997 TLVs and BEI	106.262
Tetraethylammonium Bromide	NA		106.261(a)(3)

Tetraethylenepentamine	NA		106.261(a)(3)
Tetrahydrofuran	590	1997 TLVs and BEI	106.262
Tetramethyliminobospropylamine	NA		106.261(a)(3)
Tetramethylolbisaminoethylether	NA		106.261(a)(3)
TEXLIN 300	NA		106.261(a)(3)
TEXLIN 400	NA		106.261(a)(3)
TFA-4711	NA		106.261(a)(3)
TFA-4713	NA		106.261(a)(3)
THANOL® F-3550	NA		106.261(a)(3)
Triethanolamine	5	1997 TLVs and BEI	106.262
Triethanolamine 85%	5	1997 TLVs and BEI	106.262
Triethylamine	4.1	1997 TLVs and BEI	106.262
Triethylene glycol	NA		106.261(a)(3)
Triethylene glycol diamine	NA		106.261(a)(3)
Triethylene glycol monoamine	NA		106.261(a)(3)
Triethylene glycol, reaction products with ammonia	NA		106.261(a)(3)
Triethylenediamine	NA		106.261(a)(3)
Triethyleneglycol diamine	NA		106.261(a)(3)
Triethylenetetramine	NA		106.261(a)(3)
Trihydroxypropane	10	1997 TLVs and BEI	106.262
Trimethylaminoethylethanolamine	NA		106.261(a)(3)
Trimethylolpropane	NA		106.261(a)(3)
Trimethylolpropane - 4 mole butylene oxide adduct	NA		106.261(a)(3)
Tris (2-hydroxyethyl) methylammonium hydroxide	NA		106.261(a)(3)
Tris (3 dimethylaminopropyl)amine	NA		106.261(a)(3)
ULTRAHIB	NA		106.261(a)(3)
ULTRAHIB PLUS	NA		106.261(a)(3)
Urea	NA		106.261(a)(3)
Versamine 900	NA		106.261(a)(3)
VORANOL 3136	NA		106.261(a)(3)
XAS 10773.00L Experimental Amine	NA		106.261(a)(3)
XTA 800	NA		106.261(a)(3)
XTA 801, EXPERIMENTAL	NA		106.261(a)(3)
XTA-770	NA		106.261(a)(3)
XTA-795	NA		106.261(a)(3)
XTA795LTS	262	1997 TLVs and BEI	106.262
XTA-796	NA		106.261(a)(3)
XTA-933	NA		106.261(a)(3)
XTF 947	NA		106.261(a)(3)
XTJ 755, EXPERIMENTAL	NA		106.261(a)(3)
XTJ-502 LFG	NA		106.261(a)(3)
XTJ-617	NA		106.261(a)(3)
XTJ718	NA		106.261(a)(3)
ZF-10 Crude	NA		106.261(a)(3)

HUNTSMAN PETROCHEMICAL LLC  
CONROE PLANT  
PERMITS BY RULE 106.261 AND 106.262 CERTIFIED REGISTRATION

OCTOBER 2015

**TABLE 1(a) (FORM 10153) EMISSION POINT SUMMARY**

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**TEXAS COMMISSION ON ENVIRONMENTAL QUALITY**

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

EPN = Emission Point Number  
FIN = Facility Identification Number

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